

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Crystallization of Iron and Steel.

Within the past few weeks an interesting discussion relating to the crystallization of iron and steel has been carried on in the columns of *Mechanics*, and we think that the following remarks bearing upon the subject, and submitted by Mr. E. E. Magovern, will be read with some interest. Mr. Magovern endeavors to present such facts and arguments as are at the command of an investigator of subjects of this kind. Before presenting these facts, together with the results of different experiments that have been made, the object of which was to obtain the cause and extent of the change from the fibrous to the crystalline fracture of iron, he observes that, in common with other matters of this nature, it is extremely difficult to produce full and conclusive proof that the iron which has been crystallized was of a fibrous nature when placed in the structure, as we cannot by any experiment show the change taking place. There must, however, he continues, surely be some explanation of the phenomena, say in the case of a railroad axle which when now had been passed as good fibrous iron by competent inspectors, after a rigid examination, but which after several years' wear breaks off short and presents a fracture totally different from the original structure of the iron. A sharp distinction must be drawn between a crystalline fracture and a fracture having a crystalline appearance. The former expression applies only when there exist in the fracture crystals of definite shape and size. A crystalline or granular appearance can be produced in a good iron simply by sudden fracture.

A good illustration of the actual crystallization of iron when subjected to shock may be found in the connecting-rod of the chain-testing machine at the Washington Navy Yard, the fracture of which is shown in Figs. 2, 3 and 5. The testing machine, as shown in Fig. 1, consists of a long trough, in which a 15-fathom section of cable can be stretched by means of a hydraulic press actuated by a steam pump, N. The stress is transmitted through M, the cross-head rods, to I, and the connecting link of the weighing apparatus is at the extreme left, and is so arranged that one pound placed on the scale-pan balances 200 pounds at the point of strain. The connecting-rod was 5 inches in diameter, and had been in use for 40 years. It had been frequently subjected to stresses of 250,000 pounds and upward and the recoils produced by the rupture of the test pieces. The rod had been carefully made in the anchor shop by the ordinary processes of piling and hammering. According to the record, the best quality of iron scrap was used in its manufacture, and it is supposed and believed that by this process of making the iron was of a thoroughly fibrous character. While actually employed in testing, the rod broke at 200,000 pounds, and the surface showed well-defined crystals, the faces of which were large and bright like mica, as shown in Fig. 3. The edges of this specimen having been injured, the bar was again broken at a point distant over a foot from the first fracture, and the broken surface again displayed the same characteristics, the surface obtained being shown in Fig. 2. One of the cross-head rods, M, was also removed from the machine, nicked and then broken, and the fracture was here again crystalline, as shown in Fig. 5. Here is a case of a material which was considered by competent authorities originally fibrous, yet when sub-

jected to an oft-repeated shock it became crystalline. The specimens which are shown in these engravings are preserved in the cabinet of the Mechanical Laboratory of the Stevens Institute of Technology.

Prof. Robert H. Thurston, the eminent authority on constructive materials, to whom the writer is obliged for many references pertaining to the matter in hand, refers to this remarkable case as follows: "Examining the section after rupture, the fractured section was found to exhibit strata of varying thickness, each having a characteristic form of break. Some were quite granular in ap-

pearance, but the larger proportion were distinctly crystalline. Some of these crystals are large and well defined. The laminae, or strata, preserve their characteristic peculiarities, whether of granulation or of crystallization, lying parallel to their axis and extending from the point of original fracture to a section about a foot distant, where the bar was broken a second time (and purposely) under a steam hammer. It thus differs from the granular structure

careless blow broke it, and the fractured surface was found to possess a distinctly crystalline character.

"In this example, however, the faces were nearly all pentagonal, and were usually very perfectly formed. These illustrations are conclusive of the question whether iron may crystallize under the action of long-continued and severe shocks, or of high temperature. When imperfect crystals are developed it is easy to mistake them, but the for-

ing, and the crystalline structure produced as above during long periods of time, are, apparently, as distinct in nature as they are in their causes."

In the engravings, Fig. 4 is a magnified representation of the surface of fracture of the hammer mentioned. The two holes shown, penetrating the mass, are those drilled in the first operation, preparatory to fitting the handle. The facets of the crystals are seen to be remarkably perfect and

sion of shocks or impacts, none of which alone would be sufficient to cause rupture. Wrought iron will crystallize by repeated blows in service and become weaker than cast iron. Iron axles, the piston-rods of steam engines and other pieces of metal subject to continuously repeated shocks invariably break after a certain length of service."

Fairbairn, who is considered by engineers of the present time one of the highest authorities on these subjects, writes as follows: "We know that in some cases wrought iron subjected to continuous vibration assumes a crystalline structure, and that the cohesive powers are much deteriorated." The *Journal of the Franklin Institute*, in an article on this subject, says: "With regard to the important and much-discussed question of the alteration of malleable iron when exposed to continuous vibration, in consequence of which it assumes a crystalline structure, Fuchs admits that such an alteration takes place even in the best worked metal." Roebbling, the eminent American engineer, while not wholly accepting the theory, shows a method of producing crystallization in good fibrous iron by means of shock. He observes: "Take a fibrous bar, say 10 feet long, nick it in the center with a cold-chisel, then place the bar on the short edge of a large anvil and a short piece of iron placed 8 or 9 inches from the edge of the anvil. Then strike a few heavy blows, so that each blow will cause the iron to rebound and vibrate intensely, and the result will be a granular and a somewhat crystalline fracture." In a discussion which took place many years ago before the British Institution of Civil Engineers, Mr. J. E. McConnell produced a specimen of an axle which he thought furnished nearly incontestible evidence of crystallization. One portion of this axle was clearly of fibrous iron, but the other end broke off as short as glass. The axle was hammered under a steam hammer, then heated again and allowed to cool, after which it was found necessary to cut it almost half through and hammer it for a long time before it could be broken. Other opinions were advanced pro and con, and one of the members believed that it was necessary for the iron under vibration to be strained above its elastic limit in order to be crystallized.

In concluding, Mr. Magovern says: "The facts and opinions here introduced would furnish, in my opinion, sufficient basis for a belief in the vibration theory of crystallization. We have seen that it is possible for a fibrous iron to be transformed under certain conditions into a crystalline material. How and why this is done the writer does not pretend to say. We are also aware that fibrous iron has been placed in structures subject to oft-repeated shocks, and yet when removed and tested has still shown a fibrous fracture. Probably this is because the shocks had not the intensity or were not sufficiently long continued to produce such a change. It would not be in accordance with the laws of logic to reject the present theory of crystallization merely because of its exceptions or seemingly negative proofs. The writer cannot expect through any efforts of his own to definitely settle a question which has from time to time for many years past excited the liveliest discussions and comments. The question will probably remain in its present unsettled state until our knowledge of molecular and atomic forces are opened and broadened to such an extent that definite laws governing them may be arrived at."

The subject of crystallization of iron is one

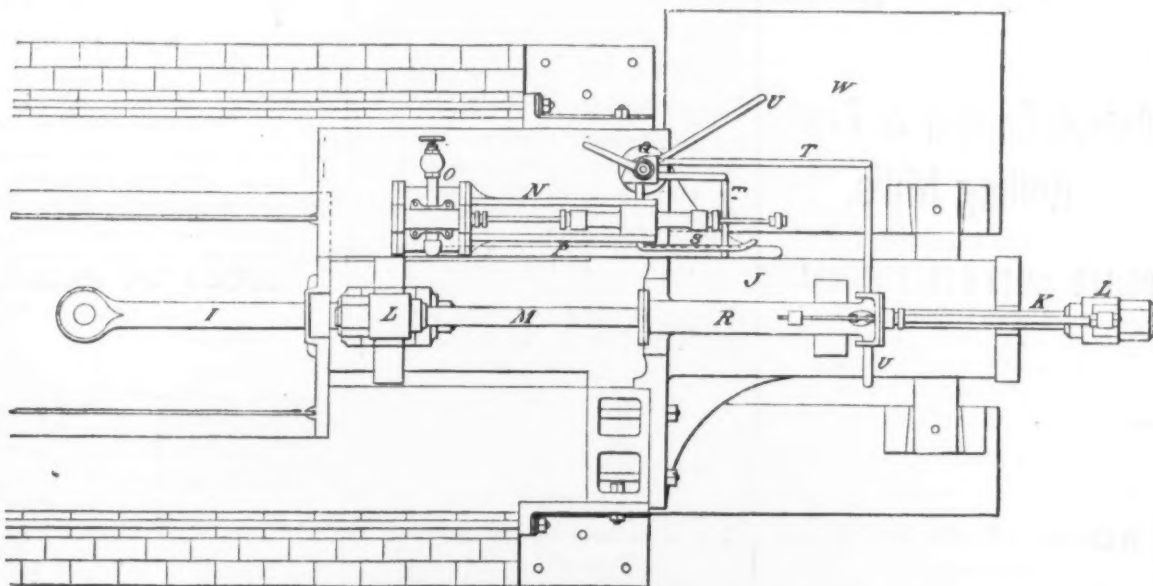


Fig. 1.—Plan of Chain-Testing Machine at the Washington Navy Yard.

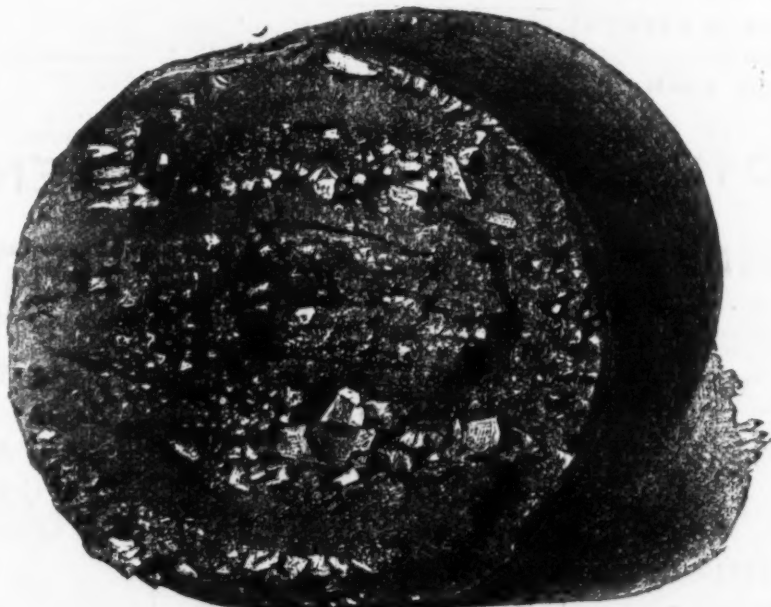


Fig. 2.—Fractured Surface of Connecting Rod, Obtained by Breaking it at a Point Distant About One Foot from the First Fracture.



Fig. 3.—Fractured Surface of Connecting-Rod of the Chain-Testing Machine.

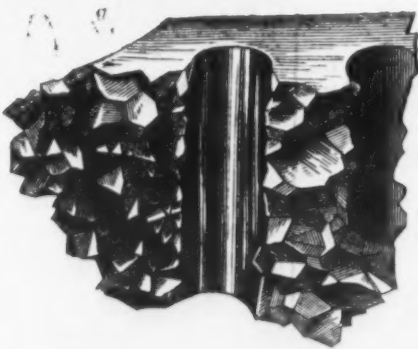


Fig. 4.—Magnified Fracture of a Steel Hammer Head which had been Exposed for Some Time to a High Temperature.

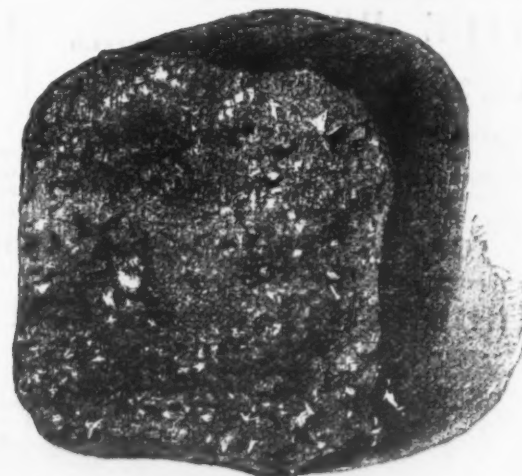


Fig. 5.—Fractured Surface of one of the Cross-Head Rods M, shown in Fig. 1.

CRYSTALLIZATION OF IRON AND STEEL.

which distinguishes the surfaces of a fracture suddenly produced by a single shock, and which is so generally confounded with real crystallization."

The same author quotes a further instance of this kind: "Were more conclusive evidence required of the occurrence of crystallization of iron, it has recently been given by an interesting incident at the Stevens Institute of Technology. A student, while annealing a number of steel hammer heads, left them exposed all night to the high temperature of the air furnace in the brass foundry. When finishing one of them a

mation of pentagonal dodecahedra, in large numbers and in perfectly accurate forms, may be considered unmistakable evidence of the fact that iron may crystallize in the cubic or a modified system. This may apparently take place either by very long-continued jarring of the particles beyond their elastic limits, or under the action of high temperature, by either mechanical or physical tremor. But no evidence is given here that a single suddenly-applied force, producing fracture, may cause such a systematic and complete rearrangement of molecules. The granular fracture produced by sudden break-

well defined. Fig. 6 represents the hammer on very nearly the natural scale. In addition to these facts, Mr. Magovern submits the following testimony and experience of others in support of this theory of crystallization. In a paper read before the American Institute of Mining Engineers at Pittsburgh in May, 1879, Mr. William Kent, an experimenter of large experience in structural materials remarked: "Another long-known result of experience"—although this has not, as the writer believes, been investigated by scientific experimenters—"is the fact that rupture may be caused by a suc-

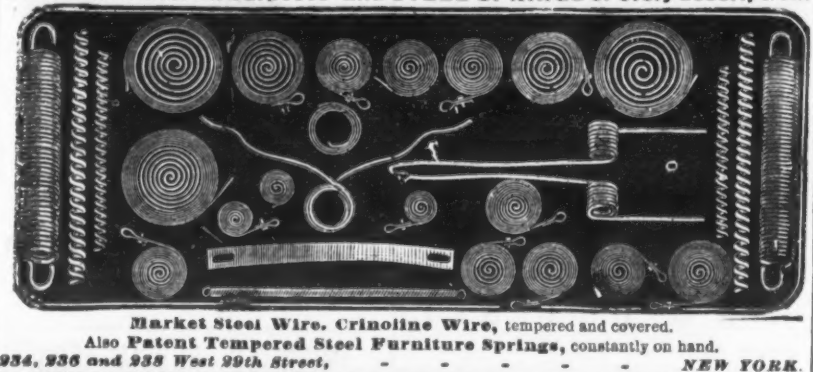
cession concerning which every mechanic has read something, and about which every one holds some opinion or other, based upon either theory, observation or practical experience. Among mechanics and engineers there are two well-defined theories upon this subject. According to one, it is believed that under some conditions, the exact nature of which, perhaps, in the present state of the art it is impossible to define, iron undergoes a change, so that from being fibrous it becomes crystalline. Some persons go so far as to cite certain uses to which iron may be put which will so change its character. On the other



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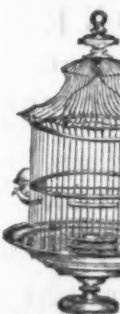
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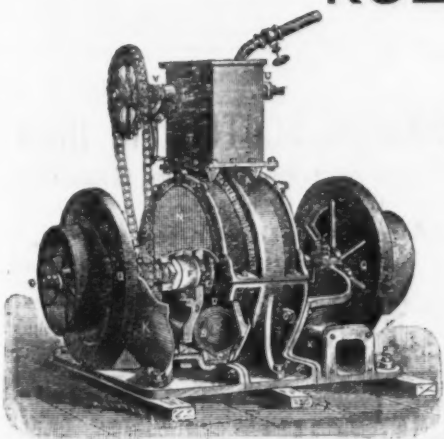
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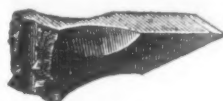
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hand, according to the other theory, it is stoutly maintained that those specimens of iron which after long use are broken and reveal a crystalline fracture were never good iron at all, and that in fact no change has taken place in their texture during their use, but that some unusual shock has broken them, and thus revealed their true nature. From the very nature of the case, it is somewhat difficult to prove or disprove either theory. Still it is possible to cite facts and circumstances and perform experiments which have an important bearing upon the question.

The advocates of the crystallization theory at the present day probably outnumber those who are opposed to it. Every mechanic has witnessed some fracture which it was difficult to explain upon any ordinary hypothesis, and which has, therefore, as a matter of course, been explained as an example of



Crystallization of Iron and Steel.—Fig. 6.—Appearance of Hammer Head and Fracture Shown in Fig. 4, on About Natural Scale.

crystallization. The fractures of wagon axles, of bridge members, of axles of steam fire engines, of parts of printing-press frames, of chain links, of hammers and numerous other parts and implements have often been thus explained. Of late, however, the question has been seriously considered by many whether this theory, after all, is tenable, and whether all such phenomena cannot be more rationally explained. A consideration of this subject, therefore, is of more than passing interest.

LATEST LEGAL DECISIONS.

ROYALTY ON PATENT.

A assigned to B certain articles upon an agreement that he should manufacture under the patents and pay certain royalties. These royalties were not paid, and a bill for an accounting was filed in the Court of Chancery of New Jersey. In this case—*Tees vs. Albright*—the bill showed that there were some questions as to the validity of the patents, the defendant claiming that he worked under another's patent, and the Chancellor granted a petition to remove the cause to the United States Circuit Court for the District of New Jersey, on the ground that the suit arose under the patent laws, and that the substantial controversy was one depending upon the construction of these laws. The cause being thus remanded, a motion was made in the Federal court to remand it to the State Court, because the questions as to the validity of the patents were collateral only to the main issue. Judge Nixon granted the motion, and said: "The real question is upon the unpaid royalties, not the vindication of any rights vested in the complainant under the United States laws. When a patentee sells out all of his interest in a patent, as in this case, how can any right remain in him which is secured to him by Congress? The validity of a patent, if directly involved, is to be determined by the Federal courts only; but when the question arises collaterally in the cause, it may be inquired into and adjudicated in the State courts."

LICENSE TO SELL PATENTED ARTICLES—TERRITORIAL LIMIT.

A bill in equity was filed by A against B, to enjoin him from selling a patented article within the limits of the territory which the owner of the patent had, by a license, granted to him, A. This case, *Ingalls vs. Tice*, was brought in the United States Circuit Court for the Southern District of New York, and the defendant set up the defense that the court had no right to try the case, as no question under the patent laws was involved in it. Judge Wallace agreed with the defendant and said: "As the defendant admits the validity and use of the patent, and a contract is shown governing the rights of the parties to this suit in the use of the invention, no question arises under the patent laws, and this court has no jurisdiction of the case. The controversy disclosed by the bill turns wholly on the construction and effect of the agreement of license, and the rights of the parties depend altogether upon common law and equity principles."

RECOVERY OF ILLEGAL DUTIES PAID—PRINCIPAL AND AGENT.

Importers gave a written authorization to third persons to withdraw from the Custom House certain merchandise, and pay the duties thereon. This merchandise had been entered for storage by the importers, and they had given the usual bond for the payment of duties. In an action to recover illegal duties exacted on these goods, *Simpson vs. Schell*, brought in the United States Circuit Court for the Southern District of New York, the Collector denied the right of the plaintiffs to sue, claiming that the authorization to withdraw the merchandise and pay the duties thereon was in effect a sale to the third parties, to whom only the overcharges were due. But Judge Wallace decided in favor of the plaintiffs, and in the opinion said: "As the plaintiffs were the owners of the merchandise and the parties primarily responsible for the payment of the duties, it is a reasonable presumption of fact that the persons who were authorized by them to withdraw the goods and pay the duties required to be paid on their withdrawal were acting in their behalf in the whole transaction. The duties illegally exacted are recoverable by the plaintiffs."

CHATEL MORTGAGE.

A borrowed money from B and gave his note therefor, which he secured by a chattel mortgage, in which it was stipulated that the mortgagee should retain possession until default, "or until such time as the mortgagee shall deem himself insecure." The mortgagee considered his security in doubt and demanded possession of the property mortgaged, but it was refused to him. He then brought an action of replevin to take the property—*Werner vs. Bergman*—and, be-

ing defeated, carried the case to the Supreme Court of Kansas, which decided in his favor. The defendant argued that the plaintiff could not demand the goods before he was in fact insecure or had some reasonable ground for alarm; but Judge Valentine, in the opinion, said: "Under the words of the mortgage the plaintiff could take the property mortgaged into his possession whenever he thought his debt in danger, and of this he was the sole judge. If the mortgagee wished to protect himself in the possession of the goods until the security of the mortgagee was actually endangered, then he should have set out his wishes in definite language; he should have said words which would have indicated under what circumstances his right of possession would have been lost."

STREET RAILWAYS—NEGLIGENCE.

A lady 75 years old, while leaving a horse-car, was thrown down and injured, and she got a verdict for \$2500. The judgment was appealed to the Court of Appeals of Kentucky, which reversed it on the ground that the jury were charged erroneously. In this case (*Louisville City Railroad Company vs. Weams*), the trial judge instructed the jury: "The company, as a carrier of passengers for hire, was bound, as far as human foresight and care would enable it, to carry the plaintiff with safety, and its obligation to her did not cease until she had alighted and freed herself from the car, or until she had alighted and had reasonable opportunity to free herself therefrom." The Chief Justice, Hargis, in condemning this charge, said: "The utmost care and largest foresight of the most skillful human being belonging to the race was prescribed as the measure of care which the driver was bound to exercise. Such a degree of care and skill is impracticable, and, if exacted, would force the railroads of this class to employ none but persons who were perfect in skill and care, so far as any human being may become so. It will be seen at a glance that such a rule would stop the business of the road, or force it to become responsible for every accident where it can be seen, after it has happened, that it might have been avoided."

ATTACHMENT OF INSURANCE MONEY IN THE HANDS OF THE INSURANCE COMPANY.

A creditor, after bringing an action against his debtor, gave the London and Liverpool and Globe Insurance Company, upon which the debtor had a claim, under his fire policy, for a loss of \$5000, notice of attachment. To this notice the company answered: "The defendant was insured in this company for \$5000, on his stock of goods, which have been burned, but as the loss has not yet been adjusted, it cannot be said what will be found due to him." On this answer in the case, *Katz vs. Sorsby*, the creditor got a judgment against the company for \$5000, and it appealed to the Supreme Court of Louisiana, which decided in favor of the company. The Chief Justice, Bernudez, in the opinion, said: "The company did not admit that it owed the defendant any specific sum of money, and as the plaintiff, by attachment, can acquire no other or greater rights against it than the defendant, it follows that, though the company be indebted to the defendant, yet if there be anything to be done as a condition precedent to the recovery of his debt in an action against the company, the plaintiff cannot obtain judgment without performing the condition. It is not enough to charge the company that it owes the defendant something; the amount due must be shown."

RAILROADS—NEGLIGENCE.

A passenger left his seat on his station, a small one, being called, and was on the lower step of the platform to leave the car, it being still in motion. A full stop was made, but, as he stepped off, the train was started with a jerk, and he was thrown down and injured. The train had stopped at the usual and customary place, and then started and drew up at the water-tank, a few feet further on. In an action for damages, *Wood vs. The Lake Shore and Michigan Southern Railroad Co.*, on the ground of negligence, the plaintiff recovered a judgment, which was carried to the Supreme Court of Michigan by the company. Judge Marston, in affirming the judgment, said: "It is claimed by the company that the plaintiff cannot recover because he was negligent in going on the platform and down to the lower step while the cars were in motion. This may be true, and might have prevented a recovery had the plaintiff been injured while standing there before the train stopped. But such was not the fact; his position on the step in nowise contributed to his injury. Upon the stopping of the train, he had then a right to get off, whatever his position up to that time may have been, and the danger of his position up to that time cannot be charged to him if he then, in the usual and customary manner and place, attempted to get off."

AGENCY—EVIDENCE OF AUTHORITY.

The authority of an agent to act in any particular manner cannot be proven by the declarations of the agent himself, made in connection with the act done; his authority as agent must be established by other evidence before his declarations can be received. —(*Gilbert vs. James*, Supreme Court of North Carolina.)

ASSIGNMENT FOR THE BENEFIT OF CREDITORS.

A debtor made an assignment for the benefit of his creditors, and in the deed conveyed "all and all manner of goods, chattels, debts and effects, and other estate of what kind and nature whatsoever, and wheresoever situated, of which he, the assignor, is the lawful owner, excepting only what and so much as is exempt from attachment." This assignee demanded, from the other partners of the firm of which the assignor was a member, an accounting to him of the latter's interest. His right was disputed on the ground that this interest did not pass by the assignment, and he then filed a bill for an accounting, *Stinson vs. Pierce*. The Supreme Court of Rhode Island decided in favor of the assignee. They said that the partnership property of one of the members was not exempt from attachment. The assignee is entitled to an account for the share of the assignor in the surplus after the payment of the debts and liabilities of the firm.

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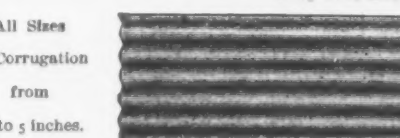
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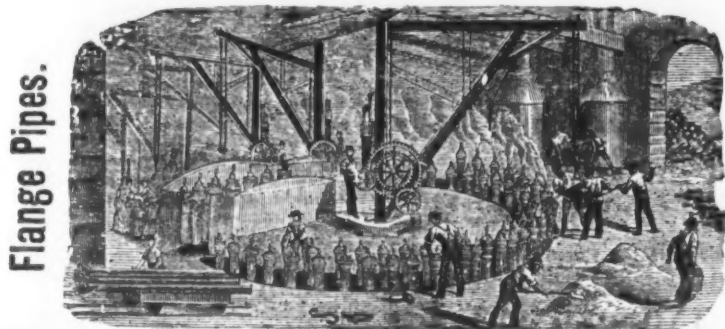
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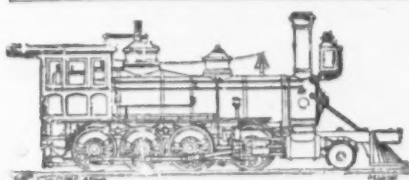
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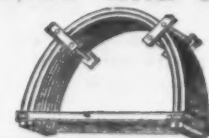
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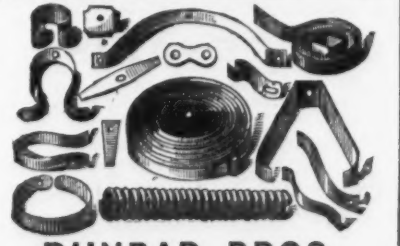
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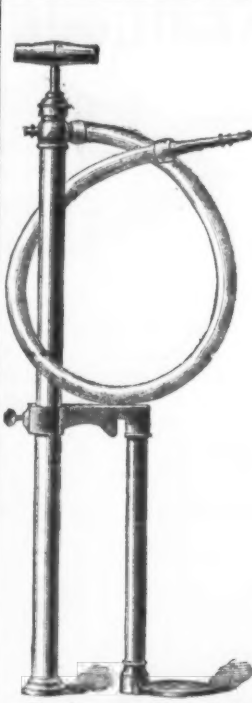
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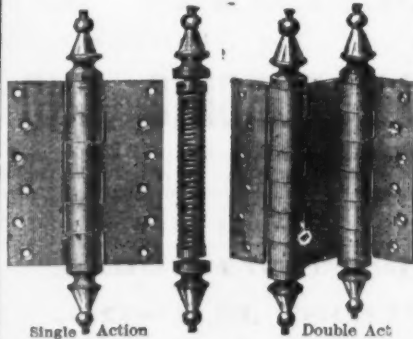
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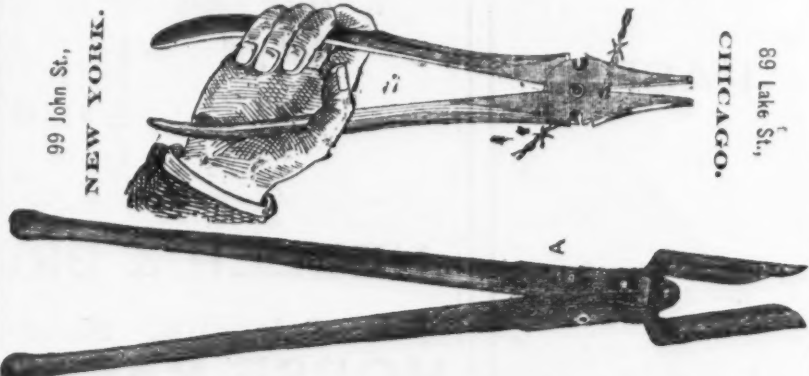
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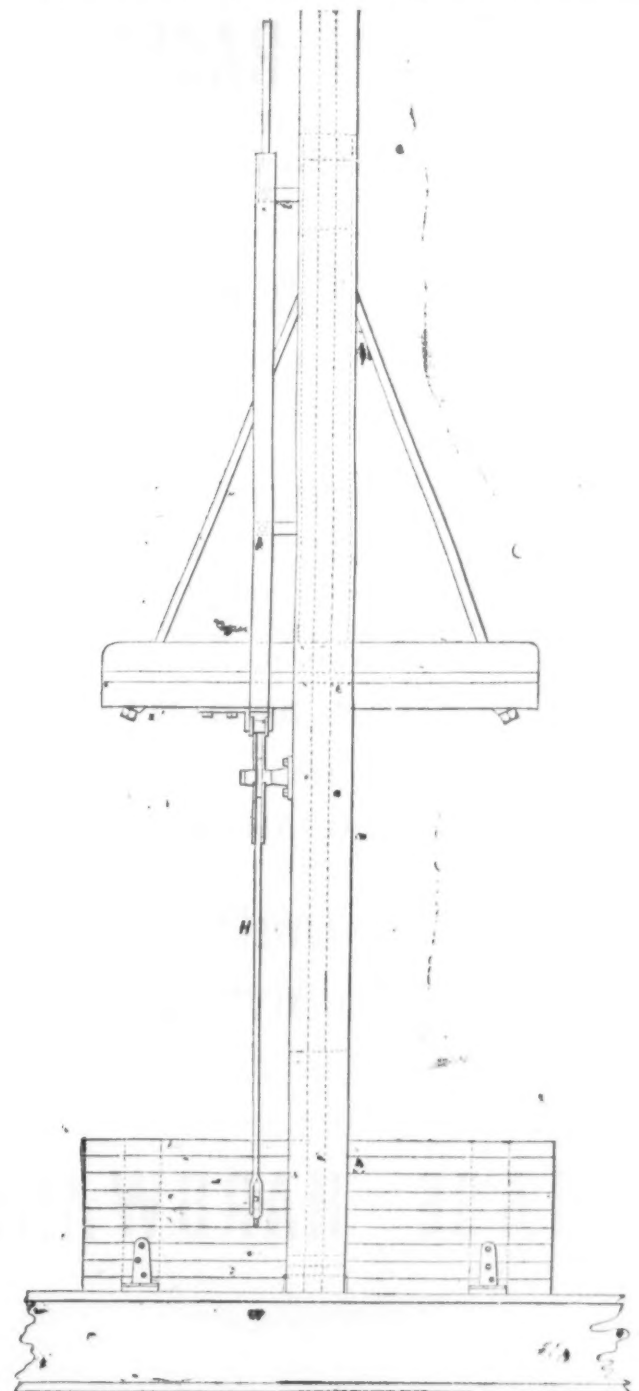


Fig. 1.—Side View of Elevator Car, Hatchway and Levers.

a very desirable form of elevator, with automatic hatch doors, have recently made some improvements, a description of which will

proved automatic door-joint, which was patented August 1 of the present year. It consists of so arranging the joint or hinge on

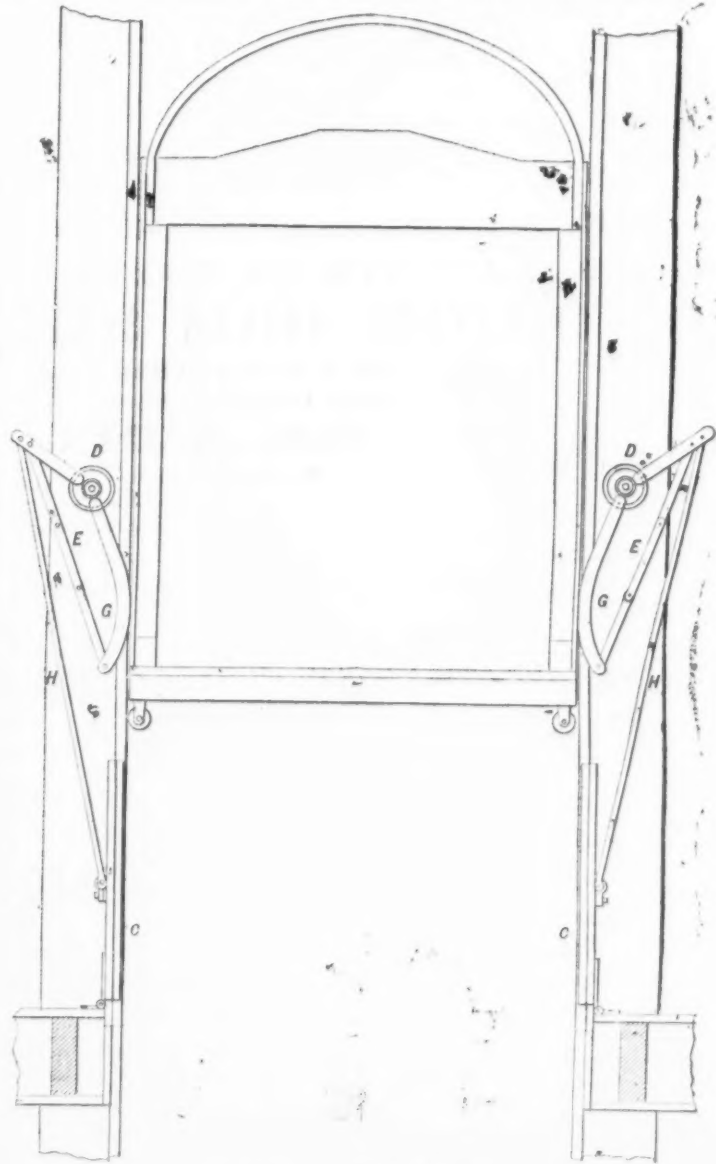


Fig. 2.—Hatchway Doors Open.

be found interesting. In fact, as the automatic portions of these elevators seem to be superior to anything which has yet been produced in this line, combining advantages of the

which the door is hung and the brakes in the guide timber that the door, in rising, makes the guide continuous from top to bottom without break, and at the same time enables

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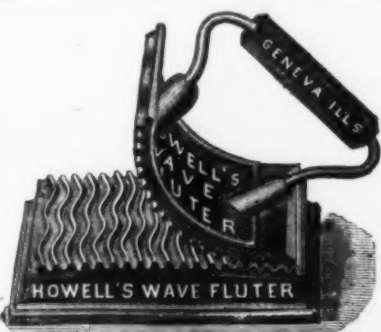
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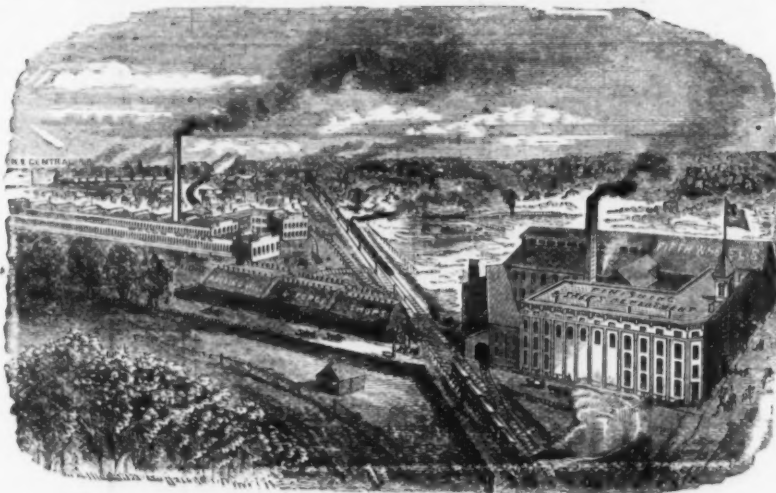
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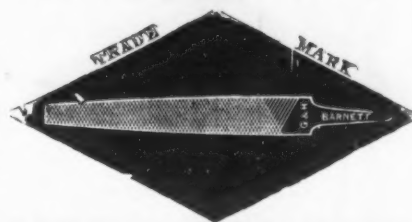
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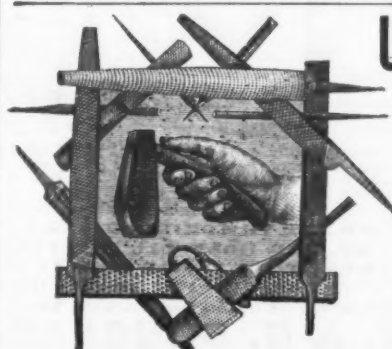
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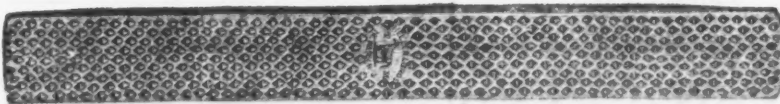
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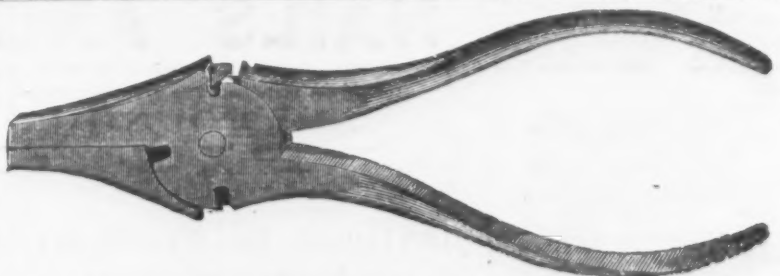
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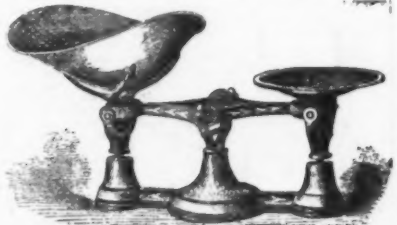
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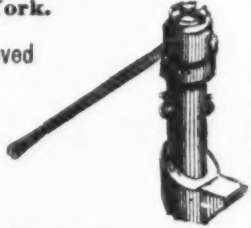
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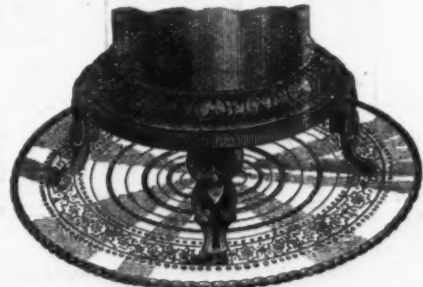
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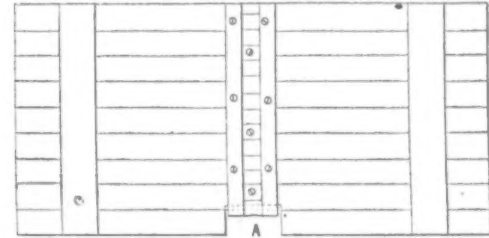
Challenge Rock Breakers.

Patented Nov. 18, 1879.

See The Iron Age first issue of the
month.

the door to close without leaving any opening at the back. The form of the door is shown in Fig. 3, where A is the recess cut for the guide. In Fig. 4 B B is the recess into which the door closes. The lower part is cut away, so that any dirt or obstruction may naturally roll out, and in doing so if it falls upon the door itself will, as the door rises, roll off and escape below without jamming. A door hung in the ordinary manner leaves a break of several inches in the guide-strip when it is raised into a vertical position, and the guide of the elevator car is very likely to be caught in this opening, and sometimes serious accidents occur in this

parts, the door can be quickly adjusted to keep its place perfectly while the car is passing up and down. Those who are familiar with the constant movement found in even well constructed warehouses, will at once see the advantage of a movable arm in this position, as it enables the doors to be kept in perfect adjustment without the necessity of taking off the door and rod and sending the bow to a blacksmith to have it drawn out or shortened, as is necessary with doors which do not have this improvement. Fig. 1 is a side view of the apparatus, showing the door partly raised by the cage or elevator platform. We have seen this apparatus



Improvements in Elevator.—Fig. 3.—Clem & Morse Hatchway Door.

way, a general smash-up usually resulting when this occurs, and, even if catching does not take place, there is usually a very unpleasant jar as the car passes the guide. Referring to the drawing at C, in Fig. 2, it will be seen that the door opens and completes the guide-strip, so that there is no opening, the notch in the door enabling it to rise sufficiently to fit the opening exactly. The guide-strip extends several inches above the floor before it is cut out to receive the door, and, as it is cut on a bevel and the guide on the under side of the door on a similar bevel, the joint which is formed is very perfect. This opening at the back of the door while it is rising prevents, as we have said, a bit of coal or other rubbish from keeping the door from going flatly back into its place. With the old style of doors, when this happens, the descending car is often caught and held up long enough to allow the cables to slacken and snarl up by uncoiling from the drum.

in operation, and certainly for smoothness and perfection of working it seemed to leave nothing to be desired. It is applicable in a great variety of situations, and seems to do away with a multitude of objections which have heretofore been urged against automatic work for hatchway doors.

METALLURGICAL NOTES.

The Extraction of Copper by the Bessemer Process.

Within the past year M. P. Maubés, a French metallurgist of Vederes, has successfully applied the Bessemer process in the smelting of copper, and it is not beyond possibility that the process will effect as great a revolution in the copper trade as it has done in the steel trade. The present process of extracting copper from its ores is rather a

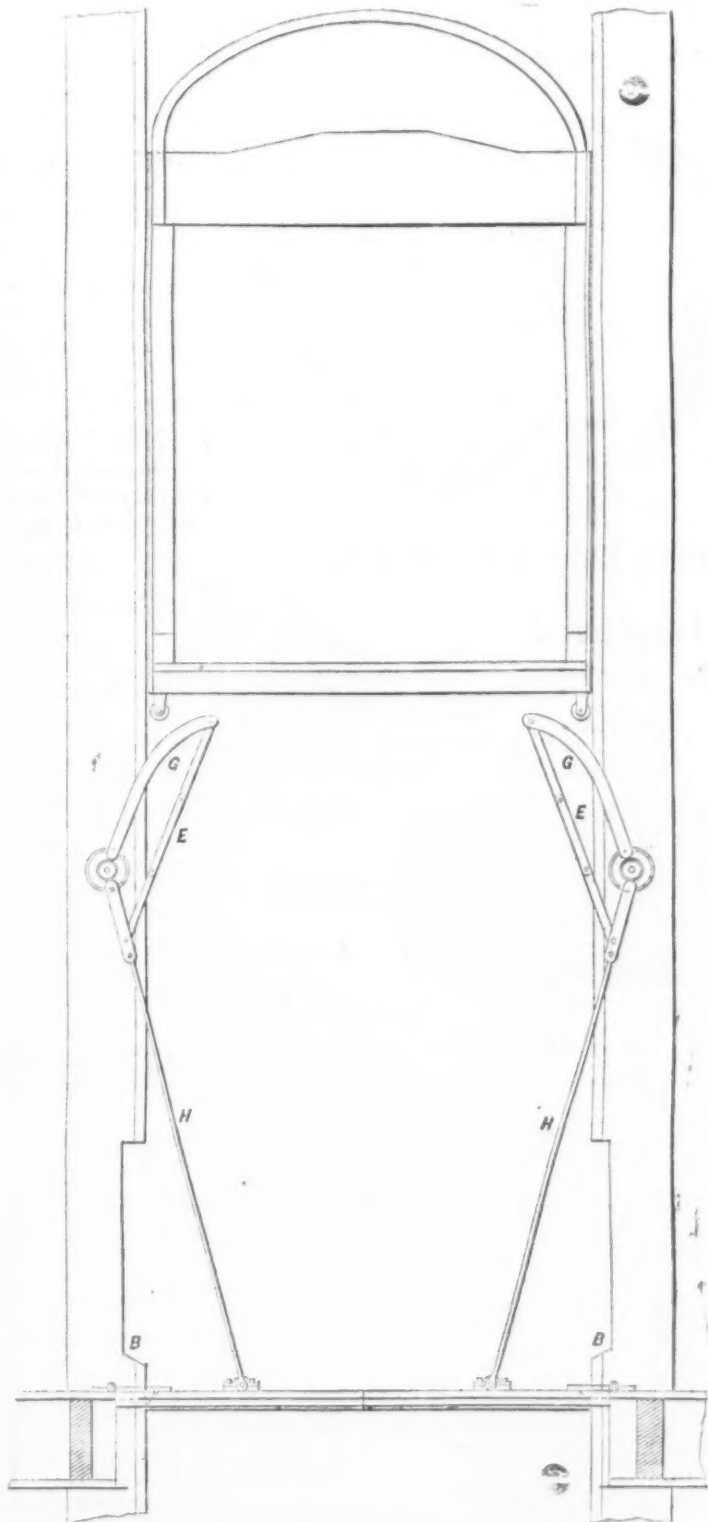


Fig. 4.—Hatchway Doors Closed.

The second improvement consists in making the lever D D, or bow by which the door is opened, in two parts, which are pivoted at the center. These are connected by two slotted rods, E E, which are clamped together by set-screws (see Figs. 2 and 4). By simply loosening these screws and lengthening or shortening the bar E, the angle of the bow G can be changed in reference to the connecting-rod H. This enables the force through which the door is held back in place to be perfectly regulated, and in case of a settling of the floors, shrinkage of the wood-work, or change in the relationship of the

cumbrous one, and may be briefly described as follows: The ores are first calcined and then smelted, and the "coarse metal" obtained is granulated. After calcining this granulated "coarse metal," it is again smelted for the production of "fine metal," which is essentially a sulphide of copper. This also is calcined, and by subsequent reduction we obtain metallic copper ("blister copper," as it is termed), which, after refining or polishing, is suitable for the market. It will be seen that the whole process presents a minimum of six distinct operations, this, however, being on the supposition that

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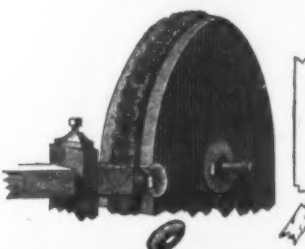
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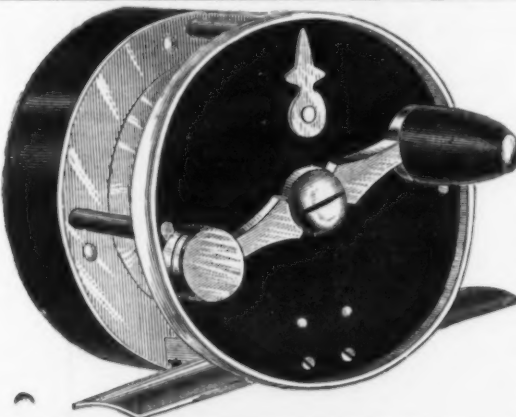
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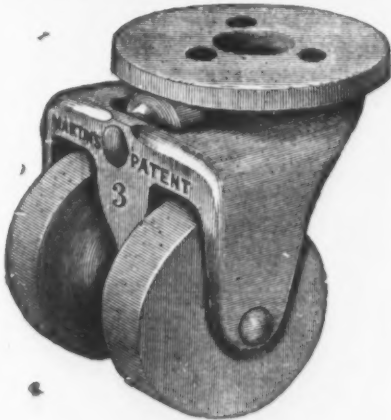
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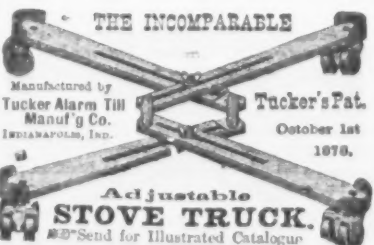
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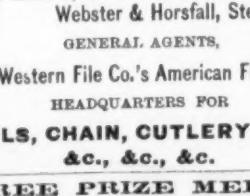
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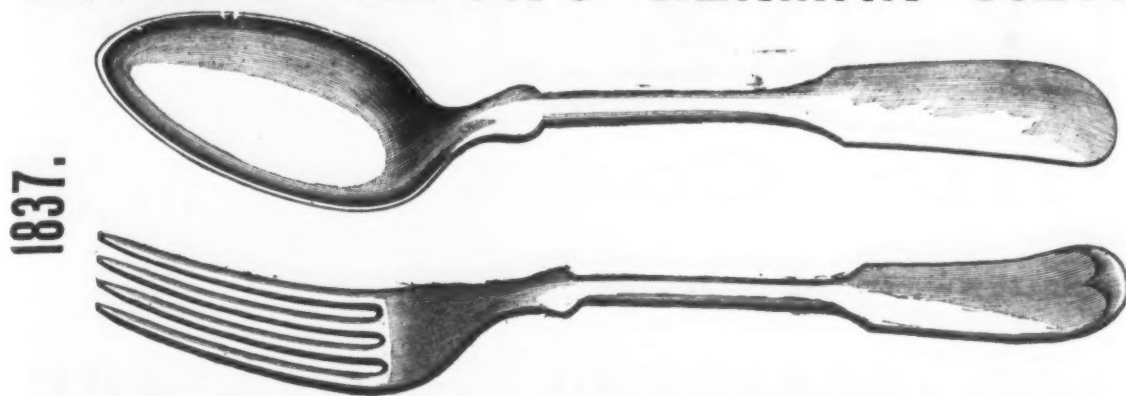
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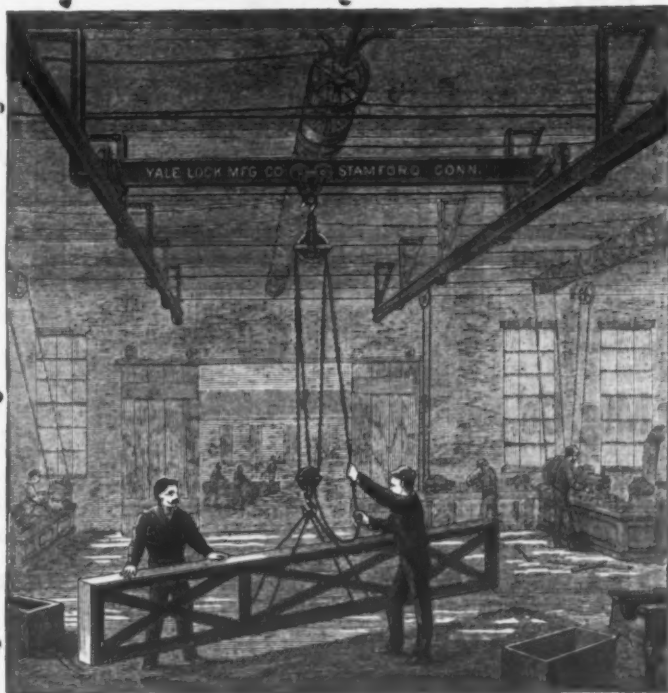
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the smelter has a considerable quantity of oxidized compounds of copper at his disposal, since otherwise the number of operations may be increased considerably. The object of the different operations is the gradual elimination of the iron and sulphur. According to the process advocated by M. Mauhé, the ore is first calcined, then melted in a blast furnace, and the melted coarse metal is, without any preliminary roasting, immediately put into the converter. The coarse metal consists essentially of copper, iron and sulphur, and the heat evolved by the oxidation of the two last substances is sufficient to carry on the operation in the same manner as the combustion of the carbon, silicon and manganese of the pig iron supplies the heat in the ordinary Bessemer process. Although the heating constituents in the latter case are capable of evolving much more heat by their combustion than the sulphur and iron of the copper, yet as the latter requires less heat, and as the proportion of sulphur and iron present in the copper is much larger than the proportion of the silicon and carbon in the iron, the requisite amount of heat is obtained. The metal as it comes from the converter must simply be refined or poled in order to make it marketable, and it will therefore be seen that M. Mauhé's process saves at least two operations, and their attendant loss of labor and fuel, not to mention the inevitable loss of metal in slags, copper, smoke, &c. The converters used by M. Mauhé differ from the ordinary Bessemer converters only in the arrangement of the blast. They are encompassed by a hollow cast-iron ring, placed some inches above the bottom, and from which about 20 small horizontal tuyeres conduct the blast into the molten metal.

The Wilson Gas Producer.

At a recent meeting of the South Staffordshire and East Worcestershire Institute of Mining Engineers, Great Britain, the Wilson Gas Producer was dwelt upon at some length in a paper submitted by Mr. A. Wilson, from which we extract the following particulars: The apparatus has an external diameter of about 8 feet, is 10 feet high, and consists of an iron casing lined with brickwork, without any grate bars; a box runs across the center of the hearth, having tuyeres in its sides, and two doors are provided, one at each side, for removing ashes and clinkers. The air is forced in by two small steam jets, each blowing down a taper pipe outside. The upper portion of the producer forms a kind of retort with an annular flue, communicating with a branch pipe, which conducts the gas to the gas main or culvert. At the top there is a bell and hopper for charging the fuel.

The action of the producer may be briefly described as follows: The interior is more than half full of fuel, which rests on the solid hearth. Into the center of this mass, near the hearth, and as far as possible from the side walls, air and steam are injected from each side of the central tuyere, which communicates with steam jet blowers outside. A rapid combustion takes place in the vicinity of the tuyeres, where the carbon is decomposed into carbonic oxide at a bright red heat, and with the hydrogen also decomposed from the steam, passes upward and escapes by the outlet ports into the annular flue, surrounding the top portion of the chamber. The coal is charged from time to time, say every 20 minutes, through the bell and hopper at the top. When the top of the coal is kept above the level of the outlet ports, as is proper, the hydro-carbons are, for the most part, distilled in the retort portion and have to pass downward to escape along with the carbonic oxide and hydrogen from the bottom. The tubes and down-corners are lined with bricks, and underground brick flues are recommended for conveying the gas to the furnaces. In this manner the formation of tar is avoided, and the small quantity of soot which is deposited in the flues may be easily removed from time to time. The producers are made in sizes to gasify from 4 to 8 cwt. of slack per hour as a maximum, but the work may be regulated by means of the steam jets. In general it is advisable to adopt two small producers in place of one large one, since this conduces to regularity in the supply of gas and does not cause stoppage for the purpose of cleaning out ashes. A recently introduced improvement is to make the steam jet of an annular form, or, in other words, to adopt a ring of steam instead of a solid jet. In this manner the proper proportions of steam and air are maintained by one jet instead of two. A dip pipe with a water seal at the exterior end of the tuyere box has also been proposed, acting as an automatic regulator, so as to control the pressure of gas.

When working on a coal containing 86 per cent. of fixed carbon, 5 per cent. of hydrogen and 4½ per cent. of oxygen, with 2 per cent. of water, the gas from these producers was found by analysis to have the following composition by volume:

	Per cent.
Nitrogen.....	55.11
Carbonic oxide.....	25.89
Hydrogen.....	12.55
Carbonic acid.....	4.00
Carburetted hydrogen.....	1.45
Total.....	100.00

The total percentage of combustible thus amounted to somewhat over 40. An examination by calculation based on the analysis of the coal used and gas produced shows that the material used in producing 100 parts by weight of gas is approximately as under:

Coal.....	15
Air.....	75
Steam.....	4

As might be expected, various analyses of the gas prove that the steam is all decomposed in passing through the mass of red-hot fuel. The steam serves three useful purposes: It reduces the percentage of nitrogen in the resulting gas, and consequently increases the percentage of combustible. It serves as a simple form of motive power to force air in, and by cooling the lowest part of the combustion chamber enables the ashes and clinkers to be easily withdrawn. From the above data the quantity of steam used in driving a gas producer gasifying 450 pounds of coal per hour may be readily calculated in a form for practical guidance. Each pound of coal takes 4½ pounds of air, or 1935 pounds per hour, or, for 150 hours per

week, say 130 tons of air. As the air is mixed with 5 per cent. of its weight of steam, the weight of the latter will equal 6½ tons. Now, as one ton of coal evaporates, at a very moderate estimate, 6½ tons of water in boilers of ordinary type, it follows that the amount of coal to be consumed under the boiler for each gas producer of this size, working night and day, is 1 ton per week—a quantity quite insignificant compared with the advantage gained. When the air is supplied at the sides, gas producers of ordinary dimensions cannot work efficiently on slack coal, since the air does not pass through the center of the fuel, and consequently does not act upon it. This defect is entirely avoided in the Wilson apparatus, in which the air and steam are introduced centrally, and cannot reach the sides before decomposition has occurred. Altogether, it will be seen that the producer is very ingeniously arranged, and, judging from its extended application, it would appear that its advantages are rapidly being recognized.

Canadian Iron Ores.

Mr. Henry G. Debrunner, of Pittsburgh, chemist at the Phoenix Roll Works, recently had occasion to inspect some extensive mineral lands in Eastern Canada, of which he gives the following account in the *American Manufacturer*: About 60 miles north of Kingston, Ont., iron mines are opened which ship largely to Bethlehem, Pa., and also to Zanesville, Ohio. The ore of these mines—at least what I saw loaded on railroad cars—is highly silicious, and not infrequently contains titanic acid, yet it finds a ready market in the States. The field of my labor is situated only 30 miles northwest of Kingston, in close communication with the Kingston and Pembroke Railroad, being separated from the track by a navigable lake of one-half a mile breadth. This iron ore, which I found in large quantity, essentially differs from the above-described ores. It is a dense, dark, beautifully crystallized hematite, the predominating form of the crystals being rhombohedrons, and analyzes as follows:

	Per cent.		Per cent.
Moisture.....	0.1402	Magnesia.....	0.0686
Loss on ignition.....	0.3500	Manganese.....	0.3709
Silica.....	3.0575	Zinc oxide.....	1.3174
Titanic acid.....	none	Phosphoric acid.....	0.1074
Copper.....	none	Sulphuric acid.....	none
Iron protoxide.....	none	Cobalt & nickel.....	traces.
Iron peroxide.....	87.1283		
Alumina.....	1.1041	Total.....	99.6075
Lime.....	traces.		
		Per cent.	
Metallic iron.....	61.00		
Phosphorus.....	0.14		
Sulphur.....	0.0428		

The resulting pig iron will contain:

	Per cent.
Phosphorus.....	0.0767
Sulphur.....	none.

The whole country abounds with numerous outcrops of this ore, which occurs in true fissure contact veins, running nearly due east and west, and dipping into the hill at an angle of about 35° to the horizon. The foot-wall of these veins is invariably granite, the hanging wall gneiss, the accompanying gangue being quartz. The ore body itself, which frequently measures from 1 to 3 feet in thickness, is occasionally interspersed with a soft "gouge" of ferruginous sandstone. The country is hilly, heavily wooded and dotted with numerous navigable lakes. Above the iron-bearing formation we find hornblende, pyroxene, mica and phosphates; the latter a species of apatite, selling at from \$18 to \$24 per ton, and largely used for the manufacture of artificial manures. The price paid for phosphates depends on the percentage of phosphoric acid it contains. Mica is also extensively found. The fact that \$500 will buy the total mineral rights on a tract of land of 500 to 600 acres is proof of how much, or rather how little, the proprietors know about the value of these minerals. The lakes are frequently connected with each other by small cascades of 50 to 60 feet in height, furnishing ample water power. Limestone is extensively found, while hardwood, eminently fit for the manufacture of charcoal, clads the hills and ravines with dense forests. Mineral coal does not exist in this section, and will hardly ever be found. Labor is paid at the rate of \$1 per day. Ore can be shipped for \$1.10 to \$1.15 per ton from Kingston to Cleveland, beside a duty of 20 per cent. ad valorem. Undoubtedly this section of Canada is worth the attention of our manufacturers, as without American capital and energy it will remain undeveloped for unknown time.

Mexican Advice to American Shippers.

"We know of a single house," says the *Mexican Financier*, "which not many years ago started business in the interior of Mexico with a capital of \$200,000. To-day their wealth is at least \$15,000,000, and they are represented by prominent branch houses in Hamburg, Bremen, Vienna and other cities. Those houses are the offshoots of the Mexican parent house. But the secret of their success lies in the fact of their strict compliance with laws often irksome and in the capable defense of their interests by competent agents. It is one of the traditions of the house that, while its record at the custom house is above suspicion, it has never incurred a fine. Other European merchants here adopt similar precautions, maintaining at the ports of entry agents who are thoroughly familiar with the language of the country and with all the details of custom-house regulations. A custom daily growing stronger among them is to invoice the goods 'as per sample attached,' and then attach to the invoice an actual sample of the importations, thus avoiding all possible dispute as to correspondence of goods with invoiced descriptions. American merchants must do the same, and so avoid annoyances which too often cause them to exaggerate existing difficulties."

The same journal says: "An unfortunate error, frequently made by American houses, is the supposition that inferior goods can be 'worked off' in this (the Mexican) market, and hence they have shown an inclination to send such goods. The absurdity of this idea is apparent to even a careless observer here. The finest goods find here the readiest market. The numerous wealthy and thriv-

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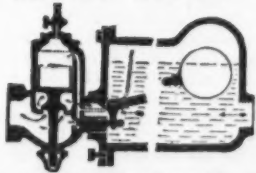
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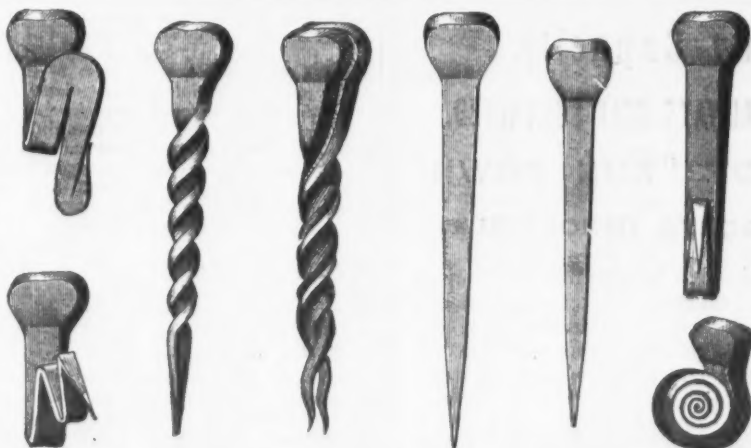
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The gun is light and compact, from 9 to 10 lbs. weight. The rifle is perfectly accurate.



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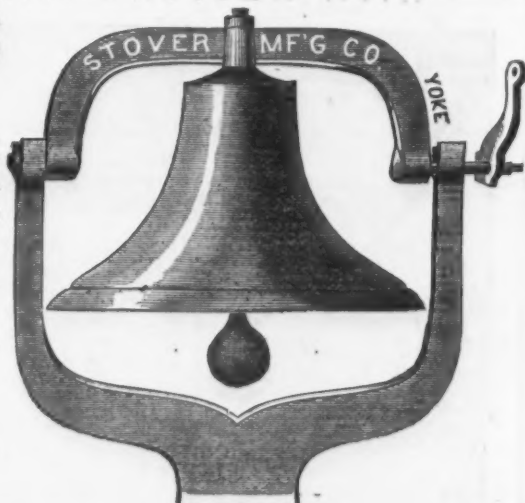
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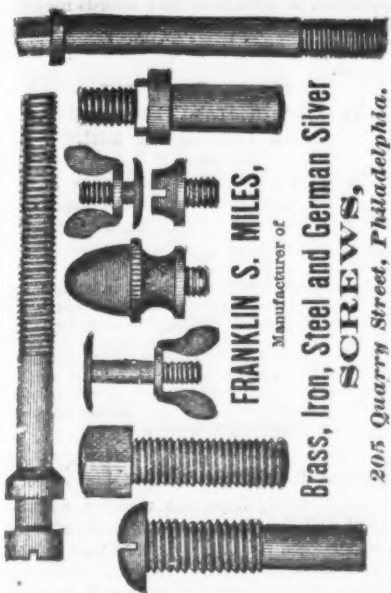
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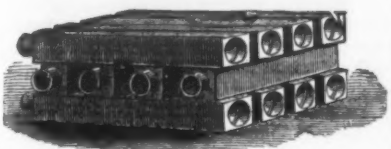
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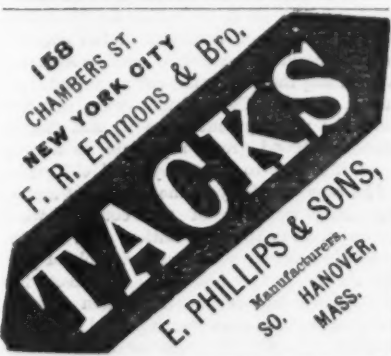


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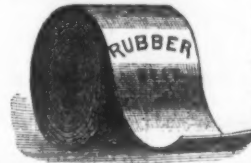
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This company manufactured the Immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for the great Elevators of the Penna. and Erie Railroads, of Jersey City and Hudson River R. R., the Lynn and many others; in fact, the largest Belts for the largest Elevators in the world.
A single carrier belt in the Penna. R. R. Elevator is over 200 feet long, weighing 18,000 pounds, and has run perfectly from the start.

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Pat. July, 1875. "CABLE" ANTISEPTIC

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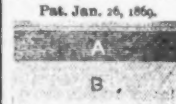
Patented. Emery Wheel.

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Solid Vulcanite EMERY WHEELS

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting grinding, and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Plows, Saws, Shovels, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small Machinery of almost every description.



Pat. Jan. 26, 1866. **PATENT ELASTIC Rubber Back Square Packing**

BEST IN THE WORLD.

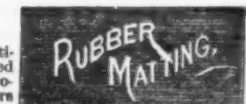
For Packing the Piston Rods & Valve Stems of Steam Engines & Pumps.
B represents that part of the packing which, when in use, is in contact with the Piston rod.
A the elastic back which keeps the part B against the rod with sufficient pressure to be steam tight.
This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.



Pat. 11,265, 213,601. **Corrugated Rubber Mats and Matting,**

For Halls, Flooring, Stone and Iron Stairways, &c.

This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, and the cheap.



Inferior quality forced on the public by reckless imitations of our patent goods soon becomes brittle and crumbles to pieces. Address
NEW YORK BELTING & PACKING CO.,
Warehouse, 39 Park Row, New York
JOHN H. CHEEVER, Treasurer.

BUCK BROTHERS, Millbury, Mass.
The most complete assortment in the U. S. of
Shank, Socket Firmer and Socket Framing Chisels.

PLANE IRONS.
CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark, also "Riverin Works."



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ing classes in Mexico purchase only the finest wearing apparel imported from Paris, and numberless stores are full of elegant articles imported from the leading mercantile and manufacturing centers of Europe. There is an abundant market here to-day for first-class goods, but it is very questionable whether trashy articles can be sold at a profit after deducting expenses of transportation, duties, &c."

INDUSTRIAL ITEMS.

MASSACHUSETTS.

Mr. J. R. Williams, Taunton, manufactures fire-brick and stove linings on a large scale. His works cover two acres of ground and give constant employment to 25 men, who turn out 130,000 fire-brick and 300,000 pieces of stove linings per year. His works are well furnished with labor-saving machinery, some of which is of his design, driven by a steam engine of 40 horse-power, built by Chubbuck & Co., of Boston. His material, sand and clay, is all brought by water and landed at his wharf, and there taken into storehouses by steam and carried to the parts of his buildings where it is required for use, by cars of his own invention. Mr. Williams commenced the business 40 years ago, and has established a reputation for making a class of goods second to none in the country, all of which find ready sale in home and New England markets.—*Boston Commercial Bulletin.*

The Winona Paper Company are about to put in a 125-horse-power engine, built by the Fitchburg Steam Engine Company. The latter company, we notice, has recently shipped an 85-horse-power horizontal engine to a flour mill in Pittston, Pa. They will soon ship a 200-horse-power to a paper mill in New York City, a 100-horse-power to a paper mill in Westfield, a 100-horse-power to the Arnold Print Works, at North Adams, and a 150-horse-power to an electric-light company at Portland, Me.—*Boston Commercial Bulletin.*

The Hamilton Mills, of Amesbury, have ordered the Curtis expansion steam trap for their works.

RHODE ISLAND.

The Sibley Scythe Works, at Newport, will soon be enlarged and commence the manufacture of scythes.

CONNECTICUT.

The Hartford Engineering Company are about to begin the manufacture of a new electric lamp and dynamo, the invention of a Mr. Schuyler, who is now the electrician of the new Schuyler Electric Light Company, of New York. The new machine and lamp have been thoroughly tested, with very favorable results. The lamp is of the pure type and gives a very steady light. The dynamo is described as extraordinarily light running, and one giving five good lights with a half-inch belt.

NEW JERSEY.

Messrs. J. F. Blair & Co., of Camden, manufacturers of planers and other special iron-working machinery, have increased the capacity of their works considerably during the past year, and are now contemplating further improvements.

The Standard Machine Works of Camden are preparing to remove to another portion of the city, and expect to occupy their new quarters early next year. At present they are fully employed on bolt and screw machinery, and make a specialty of a new and improved 21-inch lathe.

PENNSYLVANIA.

The Philadelphia Smelting Company, of Philadelphia, have successfully completed the casting of a two-blade propeller for a private yacht. The casting was made of their deoxidized bronze, and weighed 800 pounds. The blades are 10 feet long. Propellers made of this material are claimed to be much lighter and stronger than those made of cast iron, and are said to resist a strain of 90,000 pounds per square inch. The above company have recently erected a new 45-horse-power boiler, and have made several other improvements in connection with their works.

The Phoenix Iron Company, at Phoenixville, put in operation last week three more furnaces in their puddle mill. This makes 14 that they have now in operation. In August last they started with only three furnaces, and have been gradually adding others until they have reached the present number.

The machinery of the new Pennsylvania Bolt and Nut Works, at Lebanon, has been tested, and the management expect to begin operations this week.

Isabella Furnace, Chester County, has now been in blast four weeks, and promises to continue in successful operation. Last week her production was 33 tons from Garman, Porznan, San Thiago and Green ores. The place now looks like business, everything being in good order. They are building stack-houses for the ore and fuel. The old Green magnetic ore mine has been pumped out, examined, and found to be exhausted. A prolongation of the vein has been found some distance away which promises well, enough being in sight for their immediate wants. The ore contains 6 per cent. titanium, a small quantity, 8 per cent. only, being used in the furnace. It is rich in iron, 59 per cent. The production of the furnace has increased weekly, and they expect to make about 80 tons a week of cold-blast charcoal iron.—*Phoenixville Messenger.*

The car works of McKee, Fuller & Co., at Ferndale, which started up two weeks ago, are turning out 10 cars a day on a contract that will keep the works employed all winter. They are not running to their full capacity, which is 18 cars.

This week all the collieries of the Philadelphia and Reading Coal and Iron Company in Schuylkill County will be put on three-quarter time. The number of working hours will be 43 1/2 per week, instead of 68, as formerly.

The Allentown Rolling Mill is again in operation, the stoppage made last week being only for repairs.

PITTSBURGH AND VICINITY.

A slight fire occurred at the Etna Iron Works of Spang, Chalfant & Co. last week, occasioned by the bursting of a pipe which conveys the natural gas to the mill. The damage was about \$600.

Oliver Bros. & Phillips have started up their bolt works again, after a two weeks' stoppage for repairs.

Edith Furnace, the new stack of the Manchester Iron and Steel Company, was blown in for the first time last Monday.

OHIO.

The mill of the New York and Ohio Iron and Steel Company, at Ironton, is running full again, after a month's shut-down. The furnace is working very satisfactorily, averaging 38 tons per day.

The new works of the Ravenna Flint Glass Company, Ravenna, Ohio, have just been completed and put in operation. The dimensions of the main building are 65 x 65 feet; there is an additional building 40 x 40 feet; packing room, 40 x 60 feet, and lean, 12 x 50 feet. The main structure contains one 8-pot furnace, patent bucket teaser. The firm will employ 85 hands and manufacture lead-glass chimneys. Glass making commenced on November 20, and everything is progressing in a satisfactory manner.

The Akron Cutlery Works, which had to give up the site of their manufactory for railway purposes, will continue to be located in the city, Messrs. John C. and Charles Hart, with the public spirit for which they are distinguished, having donated land in the Sixth Ward for the new buildings.

The Akron Iron Company will shortly ship two carloads of their patent hot polished shafting to California, via New York and Cape Horn, making four carloads for this season that have gone to the same point over the above described route.

The Cherry Valley Iron Works, Leetonia, are finishing the largest and most complete furnace in that valley. When done, it will be 75 feet high, with 16-foot bosh. They are also building a new hoist-house and tower. Eight hundred hands are employed. The annual business amounts to not less than \$1,500,000, the monthly pay-roll footing up \$25,000 to \$30,000. The company own 1400 acres of coal land, from which they mine 7000 tons of coal monthly.—*Cleveland Trade Review.*

ILLINOIS.

Roth, McMahon & Co.'s new works, now in course of erection at the corner of Clinton and West Monroe streets, are to be 100 x 100 feet and five stories high. The basement will be used as a blacksmith shop and will contain eight forges. The first, second, third and fourth floors will be devoted exclusively to the manufacture of cracker machinery, and will furnish employment to 150 men. The pattern shop is to be on the fifth floor, and the works are expected to be ready by Christmas.—*Chicago Industrial World.*

The Union Iron and Steel Co. are now operating their entire works, and have orders ahead for some time to come.

The Polished Steel Shafting Co. have commenced operations at their new works, near Cummings.

Messrs. Benjamin, Fisher & Mallery are to build new works. The exact location has not yet been decided upon, but it will probably be on the North Side, on the line of the new Evanston Railroad. The proposed machine shop is to be 60 x 200 feet, and one-half of the building will be two stories in height. The foundry will be 50 x 200, with engine-room attached. The engine is to be a Corliss, of 40 horse-power. This company are now building two complete planing-mill outfits for Whitaker & Gallaway, Texarkana, Texas; another mill for the Trinity Lumber Co., Trinity, Texas; a mill outfit for Lincoln Lumber Co., Merrill, Wis.; and are shipping a quantity of planing-mill machinery to the Pacific coast.—*Industrial World.*

The Rockford Silver Plate Co. have commenced operations at their new factory.

MISSOURI.

The St. Louis Car Wheel Company has changed their name, and are now known as the Dutro Car Wheel Company.

The Laclede Rolling Mills are stated by the proprietors to be shut down for the winter.

MICHIGAN.

Fond du Lac Furnace will start up as soon as a supply of fuel can be obtained.

We learn that the Martel Furnace, at St. Ignace, has shut down for repairs, and will remain out of blast until the beginning of the new year. This furnace was blown in on the 15th of August, 1881, and has been steadily in operation ever since, doing excellent work. The repairs to be made consist merely of a new hearth, which is to replace the old in the casting-room, and some other unimportant, though necessary, renovation of the working parts. The furnace comes out in very good condition after its successful 15 months' run. By the time the furnace goes into blast again, the retort system of making charcoal will be in operation to an extent enabling it to run altogether on fuel charred by that process. The kilns along the line of the D. M. and M. road, which have hitherto supplied it with coal, will be abandoned, and the wood used shipped by rail to the retorts at the furnace plant, for conversion into charcoal and the by-products by the retort process.—*Marquette Mining Journal.*

The following table exhibits, in gross tons, the total lake shipments of iron ore from Upper Peninsula ports the present season, up to and including November 29, together with the amount shipped during a corresponding period last year:

Name of Port.	1881.	1882.
Escanaba	1,450,815	1,735,259
Marquette	711,509	944,500
L'Anse	53,603	70,543
St. Ignace	60,159	60,159
Total	2,275,086	2,810,511

Showing an increase of 535,424 tons.—*Marquette Mining Journal.*

The Iron Age

AND
Metallurgical Review.

New York, Thursday, December 14, 1882.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. BAYLES, Editor.
JOHN S. KING, Business Manager.

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In any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; the International News Company, New York, U. S. A., and London, England; or the San Francisco News Co., San Francisco, California, U. S. A.

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PHILADELPHIA: J. D. Weeks, Manager.

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in other countries, 5.50 or £1.25

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The Work of the Tariff Commission.

The report of the Tariff Commission is now before the country, and it is the well-nigh universal opinion of those who have examined it, even cursorily, that the charges of incompetency and inattention to duty made against the Commission were without foundation. Every one may not approve of all of the recommendations of the Commission, but it has done an immense amount of careful, thorough and intelligent work, and we believe the general verdict of the country is that Congress never had a job of tariff revision so well cut out for it before. The revision of the tariff recommended is in the line of reduction. The reductions on different articles vary greatly, but on the whole list the total amount is from 20 per cent. to 25 per cent.—the commissioners think they will average 25 per cent. The free list has been largely increased, and the duties on most of the articles in all of the schedules have suffered more or less reduction. The most notable changes which involve an increase are in the earthen and glass ware duties, Schedule B. The heaviest reductions are in the schedules of metals and sugars. The reductions recommended by the Commission seem to have been a genuine surprise to those who were prepared to attack its report, and will go far to compel those who regard all tariff as the offspring of perdition to acquiesce in the report of the Commission.

The most important work done by this Commission had three objects in view: 1. The substitution of specific for ad valorem duties and the almost total abolition of compound duties. 2. The correction of administrative defects and ambiguities in the wording of the tariff that have caused so much mischief and litigation, and the further adoption of provisions looking to their prevention in the future. 3. The adjustment of the tariff system to the changes that the advances of twenty years have made necessary.

It will be noted, in examining the report of the Commission, that ad valorem duties have been almost entirely abolished and that compound duties are retained in but very few cases. In the iron and steel part of the metal schedule, for example, outside of the n. o. f. clause, which must, of course, be retained, there are but three ad valorem rates remaining, and not one compound duty is left. It may be possible that in some cases where the same class of goods has a wide range of quality and price, this abolition of compound duties may work hardship, but the principle of specific duties is easier of application and a greater preventive of fraud. It has also made possible the adoption of the provision that manufacturers shall not be admitted at a less rate of duty than the article of chief value out of which they are made.

It will be impossible to refer to all the provisions of the report relating to the correction of administrative defects and ambiguities and to the adjustment of the law to present conditions. These provisions are found on almost every page of the report, and frequently in every paragraph of the page, and more than all else, show the intelligent, careful and laborious nature of the work performed by the Commissioners. These can be known in their entirety only by a thorough study of the proposed act. One large class of reforms proposed by the Commission relates to the removal of burdensome restrictions arising under the present law in passing goods through the Custom House. In removing these burdens the Commission was largely assisted by Mr. McMahon, and it is understood that the sections of the proposed act for accomplishing these reforms had received his approval at the time of his death. In these provisions a great many unnecessary and annoying fees are abolished and a single entry fee of 50 cents substituted. It is recommended that petty charges for stationery blanks be done away with and that the Government furnish the necessary blanks. There are also various provisions regarding the weights and measures that shall be used in invoices, and the currency in which the values of invoices subject to ad valorem duty shall be expressed. Others provide that the examination of bulky goods, such as iron ore, coal and iron, may be made at places other than at the public stores.

But more important than these is the recommendation that the oath required to be attached to invoices should be taken before an officer of the country where the oath is made, duly authorized to administer oaths, and not before the consul, as now, the consul only certifying to the fact that the person administering the oath is authorized to do so by the laws of the country. Heretofore such oaths have been made before the consul, and it is a question whether the oath taken before a consul had any legal value, a consul, as the rule, not being authorized by the law of the country where stationed to administer oaths. There is no doubt that this will do away with a great deal of false swearing and undervaluation. Another most important and radical change is the repeal of the sections of the existing law requiring the addition of internal transportation costs and charges to the basis of ad valorem duty. The penalties for undervaluation are also made more stringent; the goods are absolutely confiscated if undervalued, a small margin only being left for errors.

One of the most important and radical of all the changes is the provision for the establishment of a customs court or tribunal for the determination of disputed questions

arising under the tariff law as to the classification of merchandise. It is well known that these questions are at present determined in course by the Secretary of the Treasury, appeal being from him to the courts. The Commission recommends that these questions be submitted to the customs court, composed of three judges, one of whom shall have been a customs expert for at least ten years, and that their decision be final. We shall have more to say concerning this part of the subject hereafter.

In addition to these general clauses affecting all classes of duties, there are certain matters particularly affecting the iron and steel duties that are of great importance. Chief among these is the specifically naming articles that have been wrongfully classified by the customs service, and the enumeration of other articles concerning which, under the provisions of the law, there might be some doubt as to the right duty. The adoption of the McKinley principle, that all manufacturers shall pay no less duty than the article from which they are made, is also recommended. A definition of steel, in accordance with the commercial usage of this country and England, is also recommended.

The above are the chief changes recommended. The most important question now in connection with the report is—what will be done with it? There is no doubt that the opinions of a great many, both in Congress and out, that had been made up before the report was presented, to the effect that the report must be opposed and defeated, have been very much changed. Perhaps the opinion of what might be called the revenue reformers who are not impracticables is expressed in an editorial of a New York paper, which is one of their chief exponents. After speaking of the present tariff as a bad one of its kind, and to that extent to be abhorred, the journal in question goes on to say: "In place of it we have offered a protective tariff, it is true, framed by protectionists 'and for the purposes of protection, but one that will serve the country better and more efficiently than the present. To hesitate because the scheme was not based 'on different principles would be mere folly.' It seems that in Congress there is a very decided opinion in its favor, with some possibility that it may pass, unless untidily antagonized by interests outside of Congress.

That there are interests outside of Congress that will oppose it, seems to be manifest. Some industries very decidedly object to rates of duty provided for their productions, but we confess that it looks to us as though the most of the industries affected will unite with those who wish to take the tariff out of politics and give the country some stability upon this matter, and urge Congress to the immediate adoption of the measure virtually as it came from the Commission. This they will do in many cases, not because they believe that the measure of protection accorded them is just or in keeping with that accorded to other industries and to other branches of their own industry, but as being the best that perhaps they can get, and which, if they take at the present time, will settle the question of duties for some years to come. We believe that, with possibly the exception of one or two industries and of Congressional influence, this is the view that will be taken of the matter. We believe that both of the great political parties, with the exception of the extremists, will be glad to have this question settled in this way. We imagine, however, that the chief opposition to this settlement will come from the ranks of labor, and especially the iron laborers.

It will be remembered that during the depression of 1873 a great outcry was made in the West by the puddlers, especially regarding the use of old rails and scrap iron, and propositions were made to refuse to work this iron, except at an increased price, and a demand made on Congress to increase the duties on these materials. This tariff schedule provides for a reduction of the duties on old rails and scrap iron, and will, no doubt, occasion a great deal of opposition on the part of the workmen; but when they come to understand that by the introduction of steel rails the amount of old iron rails has been very much reduced, and that at the present time they are held at a high price, our quotations of last week showing double-headers held at \$29, and some sales of extra lots made at \$30.50, the fear of this material will not be so great. If it is the general view of the country that this schedule should be adopted, it will be very unwise of Congress, through any idea of their own importance, to insist on changing materially any of the provisions of the act involving the rates of duty. As it leaves the hands of the committee, it seems to be a very scientific piece of work, well balanced and without any conspicuous irregularities. Amendments here and there would mar its continuity and harmony. At present the disposition in both houses of Congress seems to be to pass it substantially as it stands. The Ways and Means Committee of the House and the Finance Committee of the Senate are working their way through it, and have thus far made no important changes.

We understand that Congress is to be memorialized this winter to appropriate \$1,500,000 to reimburse the subscribers to the Centennial Exhibition, by enabling the Treasury Department to refund the amount of their subscriptions, less what they have already had in the way of dividends. If

this scheme is once fairly started, we may expect it to reappear year after year as a perennial "claim." The lobby will not work such a claim for nothing, however, and we doubt if the subscribers will long think it worth while to send good money after bad in this way.

The Iron Situation.

A very important meeting of the Western Iron Association was held in Pittsburgh, on Wednesday of last week, at which a committee was appointed to draw up a statement of the views of the Western trade regarding the condition of the iron business, and also to call another meeting of the association in the near future. The circular sent out by this meeting is of so much importance as to justify printing it in full. It is as follows:

OFFICE OF WESTERN IRON ASSOCIATION, PITTSBURGH, December 6, 1882.

GENTLEMEN: At a meeting of iron manufacturers, held in this city to-day, the undersigned were appointed a committee to present to the manufacturers of the West a brief résumé of the condition and outlook in the merchant iron trade as it was developed by the statements made in the meeting.

From these statements, as to the condition of the mills and of trade, it was clearly evident that the low prices for iron which are now ruling are unparalleled, and only exist because of an unnecessary scare on the part of the manufacturers. Trade is fairly active, and the mills reasonably busy filling orders that come in, which are absolutely required for immediate consumption. Stocks are not accumulating in the hands of manufacturers, dealers or consumers, and it was developed that there was more inquiry for the future than was expected. It seems reasonably certain that the demand for iron early next year will be very good indeed. The railroads that have been constructed during the past twelve months are not one-third supplied with equipment, and it is certain that the old roads must increase theirs to move the abundant crops of the year. This applies not only to roads North, but South, where usually there is but little demand for increased facilities. The cotton crop is estimated at 7,000,000 bales, 500,000 bales more than ever before. Its grain crop is largely in excess of that of any previous year, and to move these the Southern roads must have largely increased equipment. The requirements for repairs on railroads, which will reach 115,000 miles by the close of the year, will, with the opening of spring, be very large. The requirements for repairs to existing equipment is equal to 10 per cent. of the amount of iron used in their construction, in addition to the new needed. In addition to these, the demand for iron for agricultural purposes and the general trade of the country, in view of the immense immigration, good crops and extension of settlements, must be larger this year than ever before. All these facts show the encouraging prospect for next year and the uselessness of the present scare. This scare was, no doubt, due to the published reports as to the condition of the steel-rail industry; but the fear of stoppage in this is over. Contracts for 500,000 tons of rails were placed last week; large orders are on the market anxious to be booked, but makers are not anxious to enter them at the same rates. Orders for a large number of locomotives have been placed within three weeks—55 by the Pennsylvania Railroad, 50 by a Western road—and some of the larger concerns are so well supplied with orders up to April as to be unable to book any for delivery until after that date. Large contracts for cars have been placed, and it is well known that still larger ones are ready to be offered, and this in view of the fact that at this season of the year railroads are busy campaigning for supplies for the ensuing season.

In view of these facts, and in the belief that if the actual state of the trade was fully known it would remove the tendency to lower prices, and enable us to get a fair price for our iron, the meeting decided unanimously to call a general convention of Western manufacturers for Wednesday, December 20, 1882, at 10.30 a. m., at the Western Iron Association's rooms, Pittsburgh, Pa., at which it is earnestly hoped every iron manufacturer west of the mountains will be present, that there may be a full and free interchange of views, and that there may be a thorough understanding of the condition of the trade.

Respectfully,
A. F. KEATING,
CALVIN WELLS,
H. O. BONFELL,
JOS. D. WEEKS, Sec. Com.

It would hardly be supposed that the gentlemen whose names are attached to this circular would allow such a statement to go out over their signatures, unless they were thoroughly convinced of the facts set forth. It will be noticed that they are very much in accordance with the views that have been presented in our columns during the past two weeks, and fully justify the position we have taken. The general situation of things is that iron men seem to have made up their minds to a period of small profits, but not necessarily small production. No one whose opinion is entitled to respect, however, anticipates a crash. Trade is sure to be rather weak and halting for the remainder of the year, until dealers have balanced their books and found out how long the failure list is to be, but it seems everywhere probable that the West and South will be better able to buy next year than they have been this. Any decline that was setting in in the iron trade probably has been checked already by curtailment of production and an increased demand, and it is possible that the reaction from the very lowest price obtained is not far off. What is now happening was long ago foreseen by conservative men. Good consumption, with a small margin of profits, are what the trade expect; and the process that is now going on, if rightly understood, instead of being an injury to trade, will be exceedingly healthful.

Congress has shown a commendable activity in acting upon the subject of our mercantile marine. On the second day of the session the House of Representatives took up and promptly passed a bill introduced at the last session pertaining to the shipment and discharge of seamen. As this was one of the measures recommended in the report of the joint committee appointed to investigate the causes of the decline of American shipping,

the action is auspicious and affords reasonable ground for hope that our legislators are prepared to grapple with this all-important subject.

The Eastern Iron Trade and the Tariff Commission Bill.

Mr. Oliver Williams, of Catsauqua, at the request of many in the trade, has issued the following inquiry as to whether a meeting is desired at this time:

CATSQUA, PA., Dec. 8th, 1882.
I have been requested to call a meeting of all the manufacturers of pig, bar, band and plate iron east of the Alleghenies, to consider what action it will be wise to take in reference to the report of the Tariff Commission. This meeting, if held at all, should be held at once. Are you in favor of it? Will you attend? If so, do you prefer New York or Philadelphia as the place of meeting? Please reply by early mail.

Yours respectfully,
OLIVER WILLIAMS,

Chairman Manhattan Beach Tariff Conference.

We certainly hope the meeting will be called and that the attendance will be large. There is good reason why every one in the trade should attend it. The bill presented by the Tariff Commission is not entirely satisfactory to the iron and steel men, but it is safe to assume that no bill which should exactly suit them would have much chance of securing a favorable consideration in Congress. The Eastern steel men are sore because the duty on steel rails has been placed under \$20; the Western iron men are disappointed because scrap is put as low as three-tenths of a cent per pound. But the general feeling seems to be that, taken as a whole, it is a much better bill than Congress could frame in committee, and that the manufacturers might "go further and fare worse." We have heard the views of a very large number of iron men, and they are unanimous in their approval of the bill. In fact, so general is this feeling that if it could be understood in advance that the meeting suggested in the above letter from Mr. Williams was to approve the bill, there would be a very large attendance of iron men; but if it were suspected that an effort would be made to manipulate the meeting to secure an expression unfavorable to it, it would be difficult to muster a corporal's guard of representative iron men. The opinions of the steel men we do not know so well. Probably the Bessemer people do not feel satisfied, but, as it is reasonably certain that a vigorous and determined effort will in any case be made to slaughter the \$23 duty on steel rails at this session, it may seem wise to them to accept without protest what the Commission recommend.

One good reason why the iron men are disposed to favor the Commission's bill is that it is a great deal better, whatever its objections, than the uncertainty which would follow its rejection. There are few things the manufacturers would dread more than having the whole matter of tariff revenue thrown back upon Congress by the rejection of the Commission's report. If Congress passes the bill in its present form it is not probable that any further serious effort to alter the tariff in any essential particular will be made before 1884, if then; and no objection can be urged to the bill which is half so serious as the inevitable consequences of its rejection by Congress, so far as the iron interests of the country are concerned. Another good reason for supporting the bill is that the manufacturers asked for the Commission, were satisfied with the men appointed on it, and cannot now, with good grace, repudiate its action, even if moved to do so by valid objections to its report. Many of the important manufacturing interests of the country were represented in its composition, and the report is consistent with the principle of protection to native industry. It meets the popular demand for tariff revision without making any changes which would seriously disturb general business or menace any legitimate branch of productive or distributive industry. Granted that it is not perfect—how could a commission be selected which would frame a bill to suit all the interests involved? The more we see of the Commission's bill, the better satisfied we are that it was not influenced in its provisions by other than an honest loyalty to the best interests of all classes of the American people. Considering the prominent part of the iron trade in securing the creation of the Commission, we are not at all surprised that so large a proportion of the trade favor the immediate passage of the bill by Congress.

Bankruptcy Law.

From the business-like temper manifested by Congress, no less than on account of the urgency of the subject, we may hope that a well-matured bankruptcy law will be adopted during the present session. The measure best known as the "Lowell bill," introduced into the Senate by Mr. Hoar, is one which has been thoroughly discussed and very generally approved by the New York Chamber of Commerce and other commercial bodies in our principal cities. The Senate had before it another bill of like import, but radically different in its provisions, reported by the Judiciary Committee, but this has been laid aside for the Lowell bill. In its essential features the Committee's bill was unique, embodying in no distinctive form the principles of a bankrupt law, or even attempting a definition of such a law, but proposing to vest the Federal courts with legislative as well as judicial functions

adequate to the determination of any question in bankruptcy on principles of equity alone. This, it appears to us, was an evasion. The country is looking for a sound exposition of law on a subject of vital importance, and anything short of this would be productive of numerous appeals to the higher courts and much of protracted litigation. Precisely to meet such a demand we have the bill of Judge Lowell, fitly framed, definite in its provisions as to the rights of debtor and creditor, presenting a complete code of bankruptcy law. Moreover, it has successfully withstood, thus far, the severe scrutiny of many of our most successful business men. We are glad to see that the bill has been referred to the Judiciary Committee, and we trust it will be promptly reported, substantially in its present shape.

The Retirement of Colonel Laidley.

The news from Washington that Colonel T. T. S. Laidley, of the United States Ordnance, commanding at Watertown Arsenal, has asked to be placed on the retired list, will be learned with sincere regret by his many friends outside and within the corps, and will be considered as most unfortunate by the even larger circle of scientific and manufacturing interests at home and abroad, to whom Colonel Laidley is chiefly known through the eminent services he has rendered while in charge of the Emery testing machine at Watertown Arsenal and through his own brilliant achievements as an original investigator. That the Ordnance Corps will lose by his retirement its most accomplished officer is not of so much consequence (the country would, in fact, endure the loss of the whole Ordnance Department with the greatest equanimity), but the loss of an experimenter of Colonel Laidley's attainments, in the full vigor of his powers and enthusiastically faithful to the work of which he is the acknowledged originator—this, indeed, is of great consequence. The regrets and public esteem that will follow Colonel Laidley into his retirement will certainly not be lessened by the reflection that his course of action was unavoidable, and was forced upon him by the petty persecutions of his superior—on the army list—Gen. S. V. Benét, Chief of Ordnance, who, through certain influences, was promoted over Colonel Laidley's head some seven years ago. Those who know the insolence of Washington "pets" clothed in a little brief authority, will appreciate the insufferable impertinence of Benét's order removing Colonel Laidley from the Watertown Arsenal to the Picatinny powder depot.

This trouble has unquestionably been brewing for some time, probably ever since Colonel Laidley's publication last spring of a pamphlet entitled "Remarks on the Proposition Recently Made to Remove the Emery Testing Machine From Watertown Arsenal," in which he administered a well-deserved and much-needed castigation to General Benét, and also a certain Captain D. A. Lyle, who, in a speech delivered at the Washington meeting of the American Institute of Mining Engineers, not only made an exhibition of his colossal ignorance, but availed himself of the occasion to make a covert and rather sneaking attack on Colonel Laidley. The latter, in consequence thereof, wrote several letters to Captain Lyle, which, under the circumstances, were simply unanswerable. Captain Lyle, with the impulse that sends the spanked youngster howling for sympathy to his affectionate mamma, submitted Colonel Laidley's letters to the Chief of Ordnance, though what business the Chief of Ordnance had with the private correspondence of two gentlemen in the corps was never made clear. It is characteristic of the peculiar methods obtaining at Washington in the management of army matters, that it is in the power of such men to put a slight upon an officer with Colonel Laidley's superb record, made in forty years of active service. However, there is a just law of compensation, and Colonel Laidley may well take into his retirement the assurance that his name and his work will be known in lands and places where those of Benét and Lyle were never heard, and will be remembered long after oblivion shall have charitably covered their insignificance.

Colonel Laidley was graduated at West Point in 1842, ranking sixth in a class of 56. He served in the Mexican war, and was at the siege of Vera Cruz, the battle of Cerro Gordo and the siege of Puebla, and was brevetted captain and major for distinguished services. During the war of the Rebellion, he commanded Frankford Arsenal, near Philadelphia, at that time the most important post in the department. In 1861 he compiled the edition of the "Ordnance Manual," and in 1871, after being appointed to the command of Watertown Arsenal, he began the agitation which has resulted in giving to the country the magnificent Emery testing machine. In 1875 he was appointed president of the United States Testing Board, in which position, and ever since, he has rendered distinguished services in tests and investigations of the strength and properties of materials. Colonel Laidley is also the author of a work on rifle firing and several meritorious inventions relating to ordnance equipment. His latest efforts have been directed toward obtaining an enlarged field of usefulness for the Emery testing machine, by the addition of several appliances to it which were much needed, and on this account alone his transfer at this moment was not only ill-advised, but positively improper.

Rather More Than Was Expected.

We imagine that by this time it has become evident to the manufacturers of a certain line of articles in connection with the steel trade, that it is very easy to create a feeling of uncertainty in the trade and not so easy to remove it. It seems to be generally believed in the iron and steel trades, that the cause of the recent scare was an interview with a prominent steel-rail manufacturer, regarding the extreme depression in his trade and the possible stoppage of the works of the country, which was telegraphed widely, and created a great sensation at the time. It may be that the facts were as stated. Indeed, we do not attempt to question the fact that rails have been sold in New York at \$40 a ton; that at that price there was no money in the steel-rail business, and that ruin and disaster stared the steel-rail industry in the face, unless there could be reductions in labor and materials, and unless the Tariff Commission acted wisely in regard to their recommendation as to the duty on steel rails. But, while we acknowledge that all of these things are true, and the condition perhaps was as stated, we at the same time think that it was an unusual proceeding for a business man to publish to the world such facts regarding his own business, or, in the language of Wall street, "to bear his own product." We have no doubt that there was a reason for it, and the probable reason was to bear the price of labor and materials, and bring pressure on the Tariff Commission and Congress. The result has shown that this was playing with edged tools in rather reckless fashion, and somebody has been cut. We question if it has improved the steel-rail market at all. It may have had an influence on the price of labor and materials, which will be more noticeable next year than this. It may possibly have some influence on Congress, but it is fairly open to question whether all of this could not have been accomplished quietly without alarming the country to the extent that it was alarmed by this interview. It is well known that it not only affected the steel trade, but all other trades; that large orders for iron and steel that were about to be placed were immediately withdrawn; that this interview reduced the price of a great many things all over the country, and the only reason why it did not precipitate a panic was that the country was in such an excellent condition that it could stand even such a severe blow as this.

While speaking of this subject it will do no harm to say that our friends of the steel-rail trade have rather a bad habit of exaggerating when speaking of matters affecting their business interests. We call this a habit for the reason that it has become so. Whenever there has been any occasion for these gentlemen to go before the Ways and Means Committee or the Treasury officials, they have considered it necessary to take the ground that, if matters were not fixed just as they wanted, this vast industry must inevitably go headlong to everlasting smash. When the question of the proper rate of duty on blooms was under consideration, they stoutly insisted that, unless the Treasury Department revised its ruling admitting blooms at 45 per cent. ad valorem, every Bessemer mill in the country would be shut up, and a vast army of workmen—we forget how many hundreds of thousands—would be thrown out of employment. These doleful predictions have come to be something like Mr. Mantalini's threats of suicide. When there was nothing to give them a color of probability, they made very little impression. When the conditions seemed in some sense favorable to their realization, people were naturally somewhat unduly alarmed by them. Probably in this instance they have had rather more effort than was intended, and it is to be hoped that those in the Bessemer trade who have acquired the habit of exaggeration will learn from the events of the past two weeks that it is well to think twice before speaking once in a matter so important as the immediate future of the iron trade.

In competing for the grain export trade, Baltimore has won the foremost position among the Atlantic ports. Within the last five months she must have sent out at least 1,500,000 bushels, against say 1,000,000 for New York. Many find an explanation of the fact in the present loose methods of grain inspection prevailing in New York, while others attribute the success of Baltimore to the favorable discrimination in freight rates granted by the Baltimore and Ohio Railroad, which also has an interest in the vessels taking grain charters.

Long Steel Plates.—Probably the longest steel plates ever made have just been rolled by the Otis Iron and Steel Company, of Cleveland, Ohio. The plates, of which there are two, were 50 feet 6 inches in length when sheared, 51 inches wide in the center and 3½ inch thick, and the ingots from which they were rolled weighed 4400 pounds each. They were made for Messrs. Morgan, Williams & Co., of Alliance, Ohio, and will be used in the construction of a large traveling crane which the above firm are building for the Dickson Mfg. Co., of Scranton, Pa.

The Treasury Department has issued the following circular relative to the exportation of articles manufactured in bonded warehouses: "On entries for exportation by sea of articles manufactured in bonded ware-

houses, under Section 3,433 Revised Statutes, upon which the aggregate amount of internal revenue tax and customs duty to be abated or refunded does not exceed \$100, the export bond specified in Article 589 of the General Regulations will not be required, but the exporters, under such entries, will be required to deposit with the Collector an outward bill of lading, in lieu of the foreign landing certificate, and in addition to the usual proof of official shipment and clearance. For the cancellation of bonds given prior to the date hereof, in connection with entries of the above description, bills of lading may be accepted in lieu of landing certificates, provided the requirements of the Regulations as to proofs of official shipment and clearance have been complied with."

WASHINGTON LETTER.

(From Our Own Correspondent.)

WASHINGTON, D. C., December 13, 1882.

That portion of the Tariff Commission's recommendations affecting the tariff on metals has already been given in your columns. The reasons set forth for such changes as they have urged are presented at length in their report, and of which the following is an abstract:

EXTENT OF THE METAL SCHEDULE OF THE TARIFF.

The metal section of the tariff represents a greater aggregate of products than any of the schedules excepting provisions and sundries. From a little over 22,000 persons employed in 1850, we find now nearly 300,000, while the products have increased from \$83,000,000 to nearly \$605,000,000 in 40 years. The country and trade have outgrown the legislation of 18 years ago. New processes, new terms, new articles, are now in existence, and in no part of the tariff law is revision more necessary than in this schedule. The anomaly of the finished article bearing only half the duty levied on the material out of which it is made is one instance of the numerous inconsistencies. Many of the articles enumerated in this schedule have become obsolete, and their places have been taken by substitutes of better material and the nomenclature has been changed. Metal products which 20 years ago were of so little importance as not to merit special enumeration were in 1881 imported to the value of \$13,000,000. No line of demarcation between iron and steel is now fixed by law. Decisions of Treasury officials or of the courts have undoubtedly reversed the intentions of the framers of the existing tariff. On nearly the same dates appraisements at different ports have been made so widely at variance as to seriously involve the fortunes of some of our business houses. Our courts are blocked with innumerable cases arising from customs decisions, and litigation seems to be a natural sequence to importation. The terminology and general provisions of the law are entirely inapplicable to the trade and commerce of the present day. All these causes, and many others suggested in the testimony, in the judgment of the Commission make a revision of this schedule imperative.

SPECIFIC DUTIES RECOMMENDED.

The following reasons are advanced by the Commission in explanation of the adoption of specific duties on metals:

1. That specific rates secure equal assessments of duty at all ports: It is a rare occurrence for the invoices presented by importers at interior or minor ports of entry to be increased in value, while in New York and other important ports invoices are raised to conform with foreign values. Specific rates will secure payment of the same duties at all ports.

2. That ad valorem duties are excessive when prices are high, and inadequate when values are low and in times of depression. On the other hand, reasonable specific duties do not stimulate an unnatural growth of our manufacturing industries, and when a great and unexpected demand arises for any of the staples of trade, it can be supplied from the markets of the world, and thus undue expansion is avoided.

THE DUTY ON IRON ORE.

No radical change in the existing duty on iron ore is proposed. The Commission recommends a specific rate of 50 cents per ton, instead of the present rate of 20 per cent. ad valorem. The importation of iron ores in large quantities commenced in the last half of the year 1879. The ad valorem rate of 20 per cent. during the past three years has on the average equaled a specific rate of 54 cents per ton. The difficulty of ascertaining the foreign value of such a low-priced article; the difference in valuation for the same kind of ore, at the same period, in the main ports of importation, allowing an importer to make a profit in Philadelphia, while the appraisement in New York would result in an actual loss; the fact that there are a great many cases now in litigation between the Government and importers in regard to the appraisement of iron ores, make it, in the judgment of the Commission, a necessity to adopt specific duties.

THE DUTY ON PIG AND SCRAP IRON.

The Commission recommends that pig iron and all kinds of scrap iron be classified at the same rate of duty, viz., three-tenths of a cent per pound. The slightly-increased duty upon cast scrap iron which this change of classification necessitates is of little moment, for the reason that a small quantity of cast scrap iron is now imported, and the amount in the future will, in all probability, be much less. The rates on wrought scrap and on old iron railway bars (which have been the heaviest item of scrap importation) have been reduced from \$8 per ton to three-tenths of a cent per pound. It is believed by the Commission that a further reduction of the duty on pig iron than that recommended would result disastrously to that important industry. The large amount imported last year (520,162 tons, about one-eighth of our total consumption) shows that the present duty is not highly protective. The duty on importations of pig iron in 1881 averaged only 34 per cent. ad valorem. The manufacture of pig iron is widely spread, extending through 25 States, and, considering the present depressed condition of the industry, a radical reduction would be neither wise nor politic.

STEEL INGOTS AND BLOOMS.

A specific duty on steel ingots and steel blooms, or what are generally known as rail blooms, will settle the disputes which have continued for years between the Treasury Department and importers, relating to the clause under which they should be classified. The present duty has served its purpose in a protective sense; it is now excessive and should be reduced. Under the existing tariff the price of steel rails has decreased from \$120 in 1873 to \$40 at the present time. The growth of this important industry has been unparalleled in the economic history of any country, and in a great measure may be attributed to the high rate of duties. There is every reason to believe that if it had not been for American competition the consumers during the past 10 years would have paid prices proportionately as high as those paid for foreign steel rails before the imposition of the present duty of \$28 per ton.

In uniting in the recommendation made, the Commission is conscious of the fact that it may not agree with the radical views of those who have asked that the duty be fixed at from \$12 to \$15 per ton, nor is it supposed that the proposed rates will meet with the approval of those at this time most interested—the steel manufacturers. The Commission, however, not only in the spirit of compromise, but from the conviction that the maintenance of our steel-rail works are essential to the consumer, consider that the best interests of all concerned will be subserved by adopting the rate of duty named in the schedule, viz., eight-tenths of a cent per pound. The adoption of this rate, it is believed, will prevent extravagant advances in price, will induce economy in the manufacture, and tend to discourage the erection of works in advance of the wants of trade. The reduction which the Commission recommends on steel ranges from one-fourth of a cent per pound on the lower class to about 30 per cent.—caused by the abolition of the compound duties—on the higher grades of crucible steel.

DECAY OF TRADE IN IRON RAILS.

Steel railway bars are fast taking the place of iron railway bars, and the manufacture of the latter will probably cease in the near future. Makers of iron bars in this country are struggling against the inevitable, with the superior quality and longer life of the better article fast crowding them out of the market. The importations of new iron rails for the years 1880 and 1881 were in excess of the amount of new iron rails (not taking into account the re-rolling of old rails) produced in the United States. The Commission, therefore, does not deem it wise to hasten the end of a dying industry by recommending a reduction of the present duty on iron rails.

BAR AND SHEET IRON.

The reduction of duties recommended on bar iron are as great as should be made, ranging from 10 to 20 per cent. The arrangement of the classification is in the line of simplification. Iron flat bars, rounds and squares, and the smaller and finer sizes, have been placed in different classifications respectively, and graded as to rates more in accord with their cost of production and market value. The Commission does not recommend any material decrease in the duties on sheet iron. The average is a low ad valorem percentage; and, considering the increasing importations, the adoption of the rates suggested is recommended.

HOOP, BAND AND SCROLL IRON.

On hoop, band and scroll iron a reduction is recommended on the three classes of 5, 10 and 15 cents per 100 pounds, respectively. This class of iron is not in the present law dutiable at rates proportionate to other lines of merchant iron, and, considering the additional labor over bar iron required for rolling hoops and bands, as great a reduction is recommended as would be equitable or just. The rates recommended are in a just ratio between bar iron and sheet iron. The Commission has endeavored, in scaling the duties on the various grades of merchant, plate and sheet iron, to arrange them so that the different sizes and qualities should bear a true relation to each other, according to the original cost both at home and abroad.

COMPETITION BETWEEN IRON AND STEEL IN ECONOMIC USE.

For the purpose of simplification and to avoid the many complications that arise from the difficulty in designating the exact differences between iron and steel, the Commission has placed iron and common steel, as far as possible, at the same rates. The commoner grades of steel are gradually becoming cheaper, and there is reason to believe that in the near future the value of Bessemer steel and that of iron will be identical. Steel railway fish-plates are being largely adopted in Europe, and will in time supplant the iron fish-plates in this country. Boiler tubes of steel are gradually dividing the trade with those made of wrought iron. Steel axles, low carbon sheet steel, steel beams and girders and steel locomotive tires are taken the place of the above-named articles of iron. In this view it is deemed by the Commission of the highest importance to have, as far as possible, uniform duties upon iron and common (not crucible) steel.

REDUCTIONS ON HARDWARE, IRON AND STEEL WIRE, &c.

Reductions are recommended on iron and steel hardware, railway splices, tools, saws, nails and spikes, malleable iron, wood screws, tubes and pipes, of from 20 to 50 per cent. The Commission recommends reductions ranging from 20 to 30 per cent. on iron and steel wire, and also the abolition of the present compound duties. It is also proposed to unite iron and steel wire in one class, the rates, of course, to be concurrent. The assimilation of iron and steel wire as to cost and market value, and the difficulty of distinguishing between them, in the finer gauges, appear to be conclusive reasons for this decision.

ANOMALIES OF THE DUTY ON TIN.

The present duty upon tin plates is an anomaly, the sheet iron out of which tin plates are made being dutiable under the present law at 1½ cents per pound, and then finished tin plate, after being sheared, coated with metal, and boxed, being dutiable at 1-10 cents per

pound. On account of the difference between the cost of labor in England and the United States, it is now impossible to manufacture tin plates in this country, and the few tin-plate establishments have been struggling for an existence. The Commission is of the opinion that a moderate rate of duty will develop this important industry, and that wise public policy dictates that at least a part of the amount consumed in this country of so essential an article as tin plate should be produced here.

GENERAL REDUCTIONS.

The Commission recommends the reduction of the rates upon many miscellaneous manufactures of metal, and a reduction of the rates upon copper, lead, zinc and other metals, of from 15 to 25 per cent. The present rate upon steel wire rods would appear, from reading paragraph No. 1428, page 165 of Heyl's Digest, to be 2¼ cents per pound as "steel in coils," but under a decision of the Secretary of the Treasury the duty is levied at 30 per cent. ad valorem. It is proposed that the duty be made 1 cent per pound, which is in harmony with the rates suggested for the other products of Bessemer steel.

A CHECK TO THE EVASION OF DUTIES.

In recommending the comparatively high rate of 45 per cent. for the general "not otherwise provided for" clause, the Commission is influenced by the idea that this "unenumerated" provision should be, on the average, higher than the general rates in the schedule. A reference to the testimony will show conclusively that a great many of the disputes between the importers and the Government have been caused by the attempts of consignees to have new articles, or old articles under new names, made dutiable under the low ad valorem rates of the present "not otherwise provided for" clause. It is believed that this suggestion is of the utmost importance, and that the ad valorem rates for this clause should be placed at the figure named, and in all cases should be higher than the average rate of duty on other articles in the schedule.

DEFINITION OF IRON AND STEEL.

One of the most important changes recommended is the definition of what is iron and what is steel. This clause has been thoroughly examined by experts in classification, and by many of our noted metallurgists. The annoyance and trouble which the public and the officers of the Government have had during the past 10 years in regard to the appraisement of low-carbon steels, and the litigation caused thereby, demand the passage of a law defining their character. The definition recommended is, in the opinion of the Commission, plain and simple, and it accords fully with mercantile custom both in this country and abroad, and its adoption is strongly urged. The products of the new processes—the Bessemer, Siemens-Martin, Thomas-Gilchrist, and the like, or combinations of any of them—are now and have been known to all who make, buy, sell and use the same as "steel." This is clearly defined in the proposed enactment. The definition of iron remains as recognized by science and trade for centuries.

ANXIETY TO ACT UPON THE EXCISE AND TARIFF.

It is evident, from the interest exhibited by the committees on Ways and Means and Finance, that there is a universal disposition to proceed promptly to the consideration of some measures looking to the reduction of the revenues from internal taxation, and possibly a revision of the tariff. The Senate Committee on Finance has already made some progress. Senator Morrill, chairman, has submitted an amendment to the House bill now pending in the Senate, which has been referred to that committee and will receive prompt consideration. The amendment is, in reality, a tariff bill which incorporates the entire schedules recommended by the Tariff Commission as a substitute for the present tariff, as embraced in Sections 2491 to 2516, inclusive, in the Revised Statutes. The nature of the Commission's recommendations has already been given in this correspondence.

The committee will not have time to afford a general hearing to persons interested, considering that that feature was very well covered, and the results stated by the Tariff Commission in their report. However, any person interested will be given an opportunity to submit their views upon any features of the bill, in writing or printed briefs. A few croakers in the House are disposed to set themselves up in opposition to the Senate, on the ground of prerogative—that is, as to the Senate's right to originate a tariff bill. The true state of the case is that the Senate has jurisdiction on the ground that that body has now before it the House bill for the reduction of internal revenue, and what action is recommended upon the tariff will be in the form of an amendment to that bill.

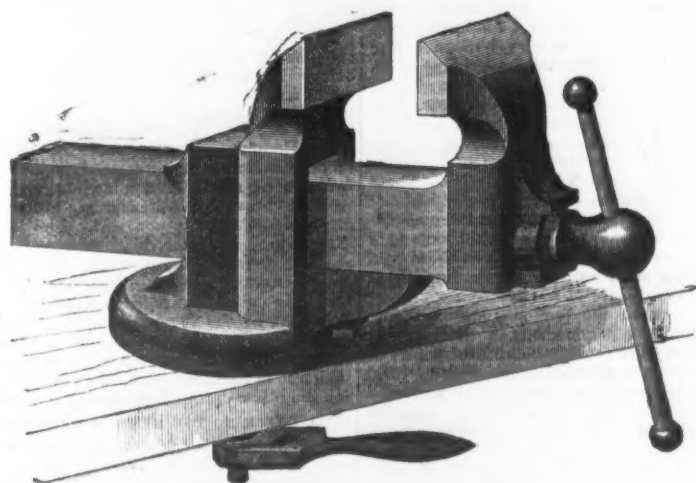
The Committee on Ways and Means are also showing great activity, particularly in steps to abolish the internal revenue taxes. The committee has already adopted a report in favor of the total abolition of internal tax on tobacco. It appears from statistics that the total revenue derived from tobacco in 1882 reached the enormous sum of \$47,391,988. Of this aggregate, \$25,033,741 was from chewing and smoking tobacco.

A bill which passed the House at last session covered the other items of taxation save spirits and malt liquors. The tariff question is also being discussed in committee, and will doubtless get into shape in a few days. The iron and steel interests are not fully satisfied with the Tariff Commission bill, but the main anxiety seems to be the desire of the manufacturers to have some action taken at the present session, even should that action be the adoption of the Commission bill intact. There has been a large mass of correspondence on this subject with members of the committee and Representatives in Congress, and several important delegations have signified their intention to come here for the same purpose.

REPRESENTATIVE-ELECT EATON ON THE PROSPECTS.

Representative-elect Eaton, of Connecticut, who, while in the Senate, was one of the originators of the commission theory of investigating the tariff question, does not speak very encouragingly of the prospects of action on the tariff. He thinks that there

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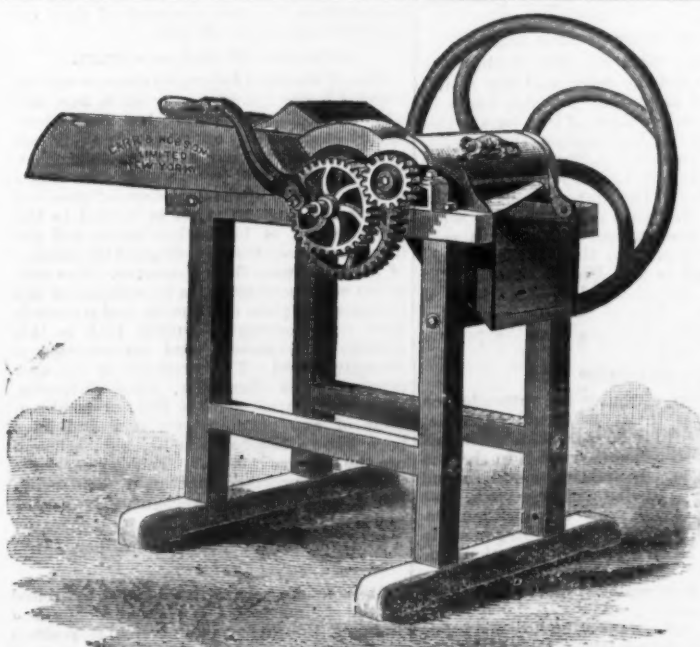
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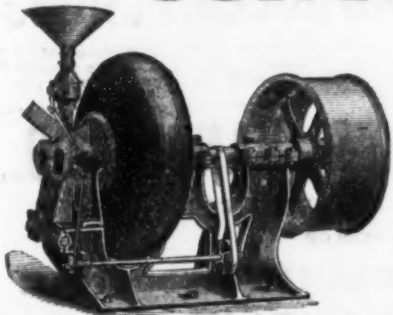


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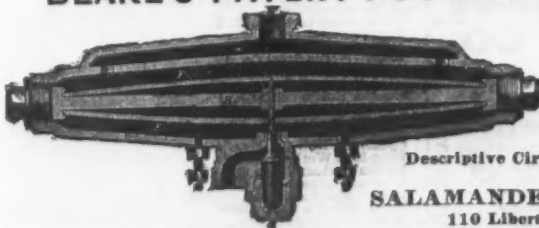
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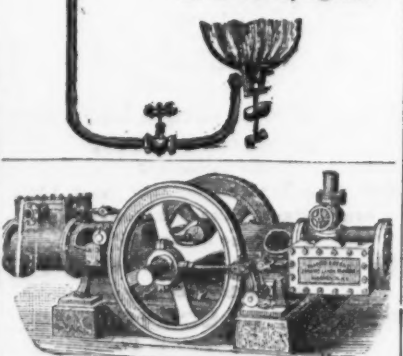


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should be a reduction of \$130,000,000 in internal taxes and an equalization of customs duties. He is silent on the labors of the Tariff Commission, but expresses some doubt as to the breadth of views of the gentlemen selected. He says he proposed a list of names which the President did not accept. Doubtless this is the main point of complaint as to the "breadth" of those who were appointed.

TESTS OF IRON AND STEEL.

The report of the tests of iron, steel and other materials for industrial purposes, made under direction of the War Department by the United States testing machine, during the fiscal year ended June 30, 1882, has been submitted to Congress by the Secretary of War and ordered to be printed. The work is quite voluminous, and embraces a large amount of data of peculiar value to manufacturers and consumers of structural materials. In regard to the bill to create a commission to make tests of iron and steel, with a view to the formulation of data for the information and use of engineers, architects, manufacturers and others concerned, General Campbell, chairman of the House Committee on Manufactures, says that the committee's bill occupies a favorable position on the calendar, but whether it can be reached or not will depend entirely upon the time consumed on the appropriation bills and the internal revenue, tariff and bankruptcy questions, which are bound to consume much of the time of the session in discussion. He is in favor of devoting night sessions to the calendar. He has no apprehensions of the result if the bill can be brought before the House.

SENATOR BLAIR AND THE LABOR QUESTION.

Senator Blair, chairman of the Committee on Education and Labor, charged with the resolution respecting the relations of labor and capital, says that the committee will get to work without delay to complete the preliminary arrangements affecting a thorough investigation of the important question assigned to them. It is proposed to hear the suggestions of authorized labor organizations throughout the country, and also to invite such representatives of the interests of capital as might be necessary to show their side of the question. Senator Blair does not expect to complete this inquiry during the present short session, though he informed your correspondent that he would make an effort to submit a supplementary report, so as to advise the Senate and the country of the progress made in the investigation and the general scope of the plans for the future.

METALLURGICAL STATISTICS.

A recent bulletin of the census returns of blast furnaces, bloomeries, forges, rolling mills and steel works gives the aggregate as follows: For 1880, 1005 establishments, \$230,971,884 aggregate investment of capital, 133,976 persons employed, \$55,476,785 amount of wages paid during the year, with \$101,271,150 worth of material used and a valued production of \$296,557,185.

STATISTICS OF GENERAL INDUSTRIES.

The complete census of all industries in the United States in 1880 has been issued, and the aggregates, as compared with 1870, are as follows:

	1880.	1870.	Per Cent.
No. establishments.	253,840	259,148	0.7
Hands employed.	8,738,050	8,053,996	33.3
Capital.	\$2,790,223,506	\$2,118,268,769	31.7
Wages paid.	\$47,910,574	\$75,584,343	22.2
Value of materials.	\$3,391,340,729	\$2,488,427,242	36.4
Value of products.	\$3,309,667,706	\$2,324,375,442	26.9

Apparently the increase during the decade referred to was small. This is explained at the Census Office as growing out of the loose methods of classification under the census of 1870. It is also possible that consolidation of establishments may have produced this surprising result. Taking the figures as they stand, without reference to the fact that in the census of 1870 shoe shops doing custom work and repairing may have been classed as establishments and in 1880 as not so, making a difference of 23,000 in 1870 and about 2000 in 1880, we see that in the former year the return for all industries was about 19 per cent. of the product, while in 1880 it was less than 16 per cent. It also appears that the number of hands increased 33 per cent. and wages 23 per cent. This was owing to the diminution of prices in everything during the intervening period.

The statistics of the manufacture of petroleum for the census year ending May 31, 1880, just issued by the Census Office, shows the immense extent of this industry. While the production of the crude oil is practically confined to Pennsylvania, the preparation of the manufactured products is very generally distributed—principally in Ohio, Pennsylvania, New York and Maryland. The following are the statistical aggregates:

Establishments.	86
Capital invested.	\$97,395,746
Hands employed, men.	9,498
Hands employed, women.	25
Hands employed, children.	340
Wages paid per annum.	\$4,381,572
Oil, crude, gals.	712,533,127
Oil, barrels (42 gals.).	17,417,655
Value.	\$16,340,581
Total value of raw materials, including oil, fuel, chemicals and packages.	\$34,999,101
Total value of manufactured products.	\$43,705,218
Value of buildings.	\$1,809,288
Value of machinery.	\$5,737,978

DECISION IN A COTTON TIE CASE.

Justice Blatchford, of the United States Supreme Court, on Monday, read the decision of that tribunal in the case of A. Badger, Collector of Customs of the Port of New Orleans, against L. L. Rowlett & Co., in relation to the proper duty to be collected on imported cotton ties. The Court in this case held that cotton ties, each consisting of an iron strip and an iron buckle, imported in bundles, each bundle consisting of 20 strips and 30 buckles, each strip 11 feet long, and the whole blackened, are subject to a duty of 35 per cent. ad valorem as "manufactures of iron not otherwise provided for," under Schedule E, Section 2501 of the Revised Statutes of the United States. This is an affirmation of the decision of the Circuit Court.

THE FINE TRADERS.

The free-trade element on the floor of the House, in view of the determination of the Committee on Ways and Means to go on with the tariff, is organizing an opposition,

with a view to antagonizing the bill when it comes up for consideration. If the opponents are disposed, they can so delay action as to render its passage within the brief period of this session impracticable. With sufficient force to demand the yeas and nays, they could demand a vote on each item. It is a question which the future only can determine, whether the bill will receive the same vote the bill creating the Tariff Commission received. This might give the friends of the measure sufficient strength to control its consideration.

TRADE PUBLICATION.

Injectors, Valves, Steam Gauges, &c.

The Rue Manufacturing Company, of Philadelphia, Pa., have recently forwarded us a very neat little catalogue relating to their various manufactures, embracing injectors and ejectors, valves, steam gauges, cocks, oil cups, lubricators, &c. Particular attention is given to their "Little Giant" injector, which is of new design and contains some valuable improvements. They have chosen the title given on account of the great power of the apparatus, and they claim to be able to create four times the pressure in the discharge pipe that the steam indicates when entering the appliance, or, in other words, steam can be taken from one boiler at a pressure of 100 pounds per square inch, and by means of it a second boiler carrying a pressure of 400 pounds may be supplied with water. In regard to lifting injectors, the company are now enabled to offer the Colvin Patent Lifter, and for low elevations, say not exceeding 10 feet, the Gresham Lifter. They are also prepared to furnish all the fittings and appliances for connecting injectors, as well as a full line of goods of the character indicated in our introductory remarks. These various appliances are illustrated in the different pages of the catalogue, and price lists and tables of dimensions are added in each case. The Little Giant boiler-testing apparatus turned out by the same company is also illustrated, and a brief description given of the method of manipulation. This apparatus, it appears, has been in use for some years past at different places, and, judging from a number of testimonials submitted, it seems to have given satisfaction in every case. A convenient table of the sizes and prices of fittings, valves, screws, &c., is given, and intending purchasers will undoubtedly appreciate its value. Gauges, whistles, lubricators &c., are treated in a similar manner, and, as already stated, numerous engravings are provided of the different appliances, so as to give the purchaser a fair idea of the general arrangement and appearance of each individual article. The catalogue is about 6 inches wide and 9 1/2 inches long, embraces 12 pages, and is provided with a very neat cover. The whole forms a very attractive publication, and is well adapted to satisfy the wants of consumers.

Window and Door Screen Corners, &c.

The Porter Manufacturing Company, of Burlington, Vt., have just issued their descriptive catalogue and price list for 1883. It is 5 1/2 inches wide, 8 1/2 inches long and embraces 28 pages, nearly all of which are furnished with engravings illustrating the various appliances manufactured by them. Among these we would mention Porter's window and door screen corners, window and door screen frames of various patterns, door screens for double doors, sash lifts, spring hinges, picture-frame vises, and various styles of Baldwin's dry-air refrigerators. These refrigerators have been before the public for a number of years past, and owing to the increasing demand the company were obliged to increase their facilities for manufacturing, and are now prepared to fill orders promptly. The catalogue also contains an illustrated description of Post's patent sash supports and bucket ladders for maple-sugar makers. An inspection of the engravings will convey a fair idea of the general arrangement of the appliances. The Porter Manufacturing Company, in issuing this illustrated price list, have endeavored to present the different styles turned out by them, and to enable any one to make the selection desired without any mistakes, and their efforts, we think, will be appreciated by those having occasion to inspect their catalogue.

Optical Instruments.

Mr. T. H. McAllister, of this city, has just sent us a condensed list of his optical goods, embracing microscopes, magic lanterns, stereoscopes, telescopes, opera glasses, &c. The pamphlet is provided throughout with numerous illustrations of the various articles, and price lists are attached in each case. Some space is also devoted to a brief description of telescopes and lenses, and this will probably be found of value to purchasers. Pocket magnifiers, reading glasses, picture glasses, &c., also receive attention, and the same may be said of opera glasses and a host of other optical instruments. Altogether, the pamphlet furnishes a very complete index relating to the appliances mentioned, and its inspection is to be recommended to those interested in this direction.

The Adams and Westlake Manufacturing Company,

of Chicago, send us a very elegant illustrated catalogue of their passenger, parlor and postal-car lamps. The pages are all tinted and have white borders, and the illustrations comprise almost everything which has ever been manufactured—certainly almost everything in the way of lamps that is now called for by railroad and car companies. Many of the illustrations are in color, and the whole catalogue is sumptuous. In addition to regular car-lamp work they make a variety of student lamps, locomotive headlights, headlight burners, water valves, hand lanterns, ship lamps, both masthead and sidelight, railroad signal lamps and bull's eyes. This company, it will be remembered, have for many years made a specialty of lamps and burners especially adapted for mineral sperm oil, a grade of petroleum or paraffine oil which has a flashing point of some 300°, and a fire test probably equal to that of sperm oil, or, say 600° F.

JUST PUBLISHED.

HOW TO KEEP A STORE.

IT WILL PAY TO READ IT.

A Thoroughly Practical Book

FOR MERCHANTS AND CLERKS.

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adaptability to the
various sizes of Pipe.
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the durability and lessening the friction. 6. Pipe can be cut off in ONE-THIRD less time than with the
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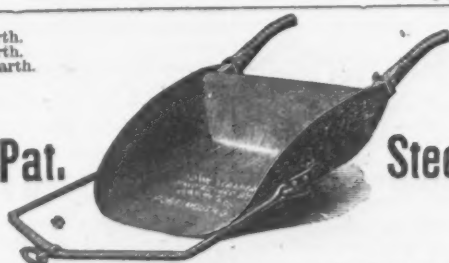
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December 27th, 1881.

The York Pat.



Steel Scraper.

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Handles are fastened inside of fold, and free from all obstructions. The body, ball and runners
are all made of steel. Especially suited for contractors. Send for circulars. Manufactured by

THE YORK MFG. CO., Limited, Portsmouth, Ohio.

A New Emery Grinder.

The accompanying illustration represents
one of the latest heavy machines for running
solid emery-wheels, built by The Tanite Co.,
of Stroudsburg, Pa. The machine is the
largest and heaviest thus far built by the
company, and is, in fact, considered to be
one of the largest offered for sale in this
country. It was originally designed to meet
the wants of one of the foreign govern-
ments in want of an extra heavy machine
on which to mount a Tanite emery-wheel 36

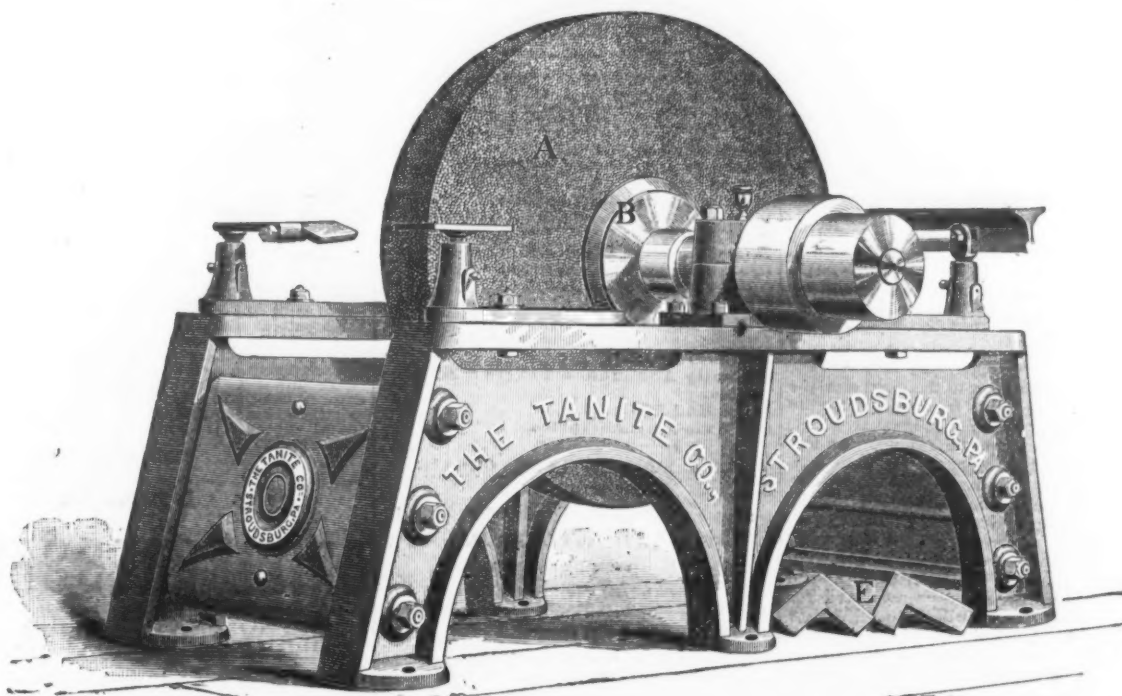
Fire Batteries.

According to *Engineering*, of London, Eng-
land, Dr. Brard, of La Rochelle, the inventor
of the electro generative fuel recently men-
tioned, and which has been patented in Eng-
land, has communicated a paper to the
French Academy of Sciences on this new
method of producing electricity. The origin
of the fuel is to be found in the discovery of
A. C. Becquerel, in 1855, that red-hot gas
carbon plunged into fused nitrate of potash
gave a considerable current through a gal-
vanometer. M. Jablochhoff afterward en-

admission of American pork into that coun-
try. The candor which prompts the meas-
ure is far more creditable than the artful
method of protecting the home producer by
declaring that hams must be taxed as manu-
factured cotton because enveloped in a can-
vas bag, or calling provisions metal because
they are inclosed in a tin can.

Coal in Cincinnati.

Superintendent Maxwell, of the Cincin-
nati Coal Exchange, is preparing a report



A New Emery Grinder.—Fig. 1.—Perspective View of the Machine.

inches in diameter, 8 inches thick and weigh-
ing about 800 pounds. The first machine
built by the concern was sent to Europe for
this purpose. The machine, of which we
give a perspective view, weighs something
over 2300 pounds. It is 5 feet 11 inches long
at the bottom, 2 feet 6 1/2 inches wide, and
stands 2 feet 3 1/2 inches high from the floor
to the center of arbor. The spindle is of
steel, is 3 feet 9 inches long, 3 inches in di-
ameter in one bearing, and 2 1/2 inches in
the other, the bearings themselves being 9
inches long. The overhead arrangement of
pulleys, which is shown in Fig. 2, and which
accompanies the machine, weighs about 237
pounds and is included in the total weight
given above. The tight and loose pulleys
shown are 9 15-16ths inches in diameter,
with a width of face of 6 1/2 inches, while the
cone pulleys are 1 1/2 inches and 1 3/4 inches

endeavored to devise a battery based upon the
fact in question; but nothing practical ap-
pears to have come of his intentions. Dr.
Brard has at least attained some practical
results, and also some theoretical observa-
tions of value. He finds that if any carbon
whatever be plunged red hot into a bath of
liquid nitrate brought to a red heat, we get
an energetic current flowing from the bath
to the carbon in the external circuit. Hard
carbon, like that used by Becquerel, and
graphite, yield the current which, however,
soon falls off, owing to a dense crust of the
salts forming on its surface. Softer carbons
give a longer current. Dr. Brard also finds
that nitrates in fusion become very fluid,
and acquire the property of moistening the
body immersed in them, as an oil does.

The capillary property of the nitrate allows
of a current being obtained by heating the

of the coal trade in that city for the past
year. From advance sheets the following
interesting statistics are taken:

The business in coal, as will be seen from
figures furnished elsewhere, has been large
in the past year, having exceeded any pre-
ceding year. This is traceable to an un-
usual period in which the river has per-
mitted coal to be transported from the
mines, the activity in our manufacturing
establishments, and to a generally improved
demand. The season, too, has been un-
usually favorable to retail dealers, who
mainly have had a profitable season's work,
in striking contrast with a number of years
in the past decade. What has contributed
most to this has been the good understand-
ing as to the rates secured through the organ-
ization of the Coal Exchange, which has been
in successful operation during the period.
Larger quantities have arrived from both the
Pittsburgh and Kanawha regions than ever
before, while to the rail facilities have been
added the Cincinnati Northern Railroad and
its connections, by which considerable sup-
plies have already come from the Ohio River
region. While the year has been favorable
to the retail dealers, to the wholesale men
it has been an unprofitable season. Prices
have been low, and the cost of mining has
materially increased. In the Pittsburgh re-
gion miners received 4 cents per bushel dur-
ing most of the year, instead of 3 1/2, as pre-
viously, and in the Kanawha locality 3 cents,
compared with 2 1/2 cents. In the Kanawha
region there was a strike commenced in the
early summer, which continued until the close
of the year, while strikes also prevailed along
the railroads in the Pittsburgh region.

The aggregate receipts of coal of all kinds
in the past year were 59,267,620 bushels, in
comparison with 40,244,438 bushels in
1880-81 and 48,198,246 bushels in 1879-80.
Of the entire receipts in 1881-82 there came
by river 55,161,943 bushels, or 93 per cent.
of the whole, compared with 37,084,024
bushels, or 92.1 per cent. in 1880-81, and
44,921,786 bushels, or 93.2 per cent. in
1879-80, and by rail 4,105,672 bushels, or 7
per cent. of the whole, in comparison with
3,160,414 bushels, 7.9 per cent. of the whole
in 1880-81, and 3,276,460 bushels, or 6.8 per
cent. in 1879-80.

Prices have been well maintained through-
out the year. After the conclusion of the
low water in November, Pittsburgh (Youghio-
gheny) coal made its appearance at 12 cents
per bushel afloat, and thence declined until
the middle of January, when it reached 10
cents, at which it remained until late in
March, when it was quotable at 8 cents, at
which it remained, with little interruption,
until the close of the year, Campbell's Creek
(Kanawha) commanding the same prices, and
Ohio river ruling at 1 to 2 cents below these
quotations. The average quotation for Pitts-
burgh coal afloat, was 8.78 cents per bushel,
in comparison with 10.23 cents in the pre-
vious year, showing a reduction of 1.45 cents
per bushel. The average for the same coal
delivered was, in the past year, 14.47 cents,
compared with 15 cents in 1880-81, exhibit-
ing a reduction of only 0.53 cents. From
this it would appear that the reduction to
retailers had been small, compared with the
diminished prices at wholesale, but this is
largely apparent, for in the average, at
retail, the prices of the entire year are
embraced, taking in the first three months,
when coal of all kinds, because of low water
and a consequent scarcity, commanded high
prices; whereas, in the same period, no coal
was here to be quoted at wholesale. The
average quotation of Pittsburgh coal at retail
for the same period in which it was furnished
at wholesale in the past year was 13.43 cents
cents per bushel, instead of 14.47 cents, as
shown by the whole year's compilation.

The average in the past year for Campbell's
Creek, both afloat and delivered, was practi-
cally the same with Pittsburgh, the only dif-
ference having arisen from the earlier ar-
rivals of the former, which, at the high
prices, slightly affected the averages at
wholesale. The comparison, at retail, be-
tween the two years, for Campbell's Creek,
would be as follows: 1881-82, 14.47 cents;

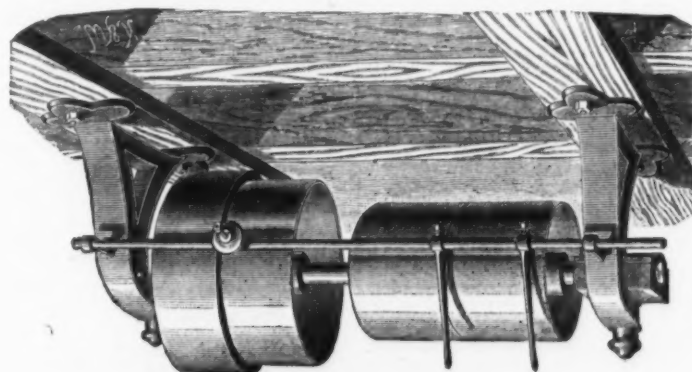


Fig. 2.—Overhead Arrangement of Pulleys.

in diameter respectively, with a width of
face of 5 1/2 inches. The machine, as
stated, is very heavy and massive, and the
workmanship throughout is all that can be
desired.

SCIENTIFIC AND TECHNICAL.

Discharge of Water Over Weirs.

The subjoined table of the discharge of
water over a weir, in cubic feet per minute
for each foot in width, may prove of interest.
It is based on the following formula: The
quantity in cubic feet per minute equals 4.85
times the length of weir in feet multiplied by
the square root of the third power of the
height over weir, measured in inches.

Depth inches.	Quantity discharged.	Fractions of inches.		
		1/4.	1/2.	3/4.
1	4.849	.606	1.714	3.150
2	13.717	1.677	4.500	11.227
3	25.199	2.813	7.754	18.910
4	38.796	4.090	11.000	28.203
5	54.218	5.513	15.254	39.104
6	71.272	7.072	20.500	51.615
7	89.813	8.767	26.754	65.727
8	109.711	10.594	34.000	81.440
9	130.935	12.554	42.254	98.753
10	153.533	14.647	51.500	117.665
11	177.522	16.872	61.754	138.176
12	202.918	19.230	73.000	160.387
13	229.729	21.720	85.254	184.298
14	257.962	24.343	98.500	209.909
15	287.625	27.099	112.754	237.220
16	318.725	29.988	128.000	266.231
17	350.271	32.910	144.254	296.942
18	382.271	35.965	161.500	329.353
19	414.734	39.154	179.754	363.464
20	447.661	42.477	199.000	399.275

end of the carbon not immersed, provided
the carbon is not too long. Moreover, it is
not essential that the nitrate should be in
contact with the carbon. It may be con-
tained in a metal capsule placed upon the
red-hot carbon, and the current will flow as
before. This is owing to a connection be-
tween the nitrate and carbon being set up by
a film of nitrate stealing over the sides of the
capsule. A useful battery is made by cover-
ing the capsule with asbestos cloth, then a
coating of lamp-black, and plates of metal
over the black. The latter serve for the
negative and the capsule for the positive pole
of the element. Placed over a Bunsen burner,
a couple thus made gives, when the nitrate
is in fusion, a constant current of from 6 to
7 milliamphères. It should be situated as
near the point of flame as possible, where the
hot smoke is given off. This soot takes the
part of the hot carbon rod in Becquerel's ex-
periment. The nitrates melt at 200° C., but
do not decompose except at 1000° C. or 1200°
C., and appear to prevent oxidation of the
metals, or at least retard it considerably.

A New Explosive.

Austrian papers announce the discovery
of a new explosive, which is claimed to have
the advantage of being less costly than any
other, not giving off any injurious gases,
and not exploding by receiving a blow or by
friction. Its composition is given in the fol-
lowing table, No. 1 being for hard rocks, such
as basalt, &c., and No. 2 for softer material,
such as sandstone:

	No. 1.	No. 2.
Salt-peter	35	42
Soda	19	22
Refined sulphur	11	12.50
Sawdust	9.50	10
Chlorate of potash	9.50	10
Charcoal	6.00	7.00
Sulphate of soda	4.25	5.00
Prussiate of potash	2.75	3.00
Refined sugar	2.25	5.00
Picric acid	1.25	1.50

These ingredients are finely powdered and
mixed, adding from 10 to 15 per cent. of
water.

The German Bundesrath has under con-
sideration an ordinance prohibiting the

1880-81, 14.87 cents per bushel. The quotation for Ohio River, alfalfa, was 7.30 cents, in comparison with 7.85 cents in the previous year; and for coal delivered, 12.25 cents, in comparison with 12.36 cents. The average for Hocking and Muskingum Valley coal, delivered, was 12.47 cents, in comparison with 13.55 cents in 1880-81; Raymond City, delivered, 13.47 cents, compared with 13.97 cents; and canal, delivered, 21.84 cents, in comparison with 22.88 cents. The average quotation for anthracite, per ton, was \$3.21, in comparison with \$3.03 in 1880-81.

Tree Planting by Railway Companies.

Tree planting by railway companies formed the subject of an interesting paper recently read at the American Forestry Congress, at Montreal, by Professor Hough. It was stated that since there were in the United States about 100,000 miles of railway, the advisability of tree planting by railway companies for construction and maintenance was an important question, from 2200 to 3000, and even 3500, trees being used in a mile of rails. The average duration of ties is from five to eight years, and consequently from 30,000,000 to 50,000,000 a year will be required for 100,000 miles of railway. Putting 500 ties as the product of an acre of woodland, from 60,000 to 100,000 acres will have to be cut every year, and as it takes 30 years for a tree to grow to the right size, the railways will require from 2,000,000 to 3,000,000 acres (or 3125 to 4687 square miles) of forest to keep up the supply. At this rate there should be 25 acres for each mile of road, involving an investment of \$500 in land per mile—a wise investment, giving the railways an independent supply of ties. Professor Hough, moreover, stated that wood fuel is being superseded by coal, and wooden bridges by stone or iron. In Europe wood in railway structures is very rare, and for ties mineral substances will be much dearer than wood for some time. The paper was concluded by some remarks relating to the necessity of planting trees along embankments. This would prevent snow blockades to some extent, and the roots would hold the embankments together. It will be readily acknowledged that the propositions advanced are well worthy of serious consideration, and we understand that one of the Western roads has already displayed some activity in carrying out the plan advocated.

The Russian Fleet.—The Russian Admiralty has for some time past been considering a project for increasing the fleet of the Baltic, by the addition principally of light cruisers, and for constructing a strong iron-clad fleet for the Black Sea. It is reported that the following programme for 1883 has been drawn up: In all, 9 war vessels are to be constructed, 7 for the Baltic and 2 for the Black Sea; 2 ironclads for the Baltic will be built at the Baltic works, and are estimated to cost 2,500,000 roubles; 1 cruiser at the Nevsky works, to cost about 400,000 roubles; 2 cruisers at the Baltic and Nevsky works, to cost 800,000 roubles, and 2 gunboats at other yards in St. Petersburg, to cost 415,000 roubles. For the Black Sea 2 ironclads are to be built, one at Sebastopol, by the Russian Society of Navigation and Commerce, and the other at Nicolievsk, the total cost for all the 9 vessels being 7,469,643 roubles. Measures are also on foot for strengthening the forts at Cronstadt, in consequence of the lesson taught by the English bombardment of Alexandria, and military engineers are now being consulted on the subject.

Special Notices.

For Sale.

Engine Lathes, 30 in. swing, 30 ft. bed. 2d hand. Engine Lathes, 43 in. swing, 14 ft. bed. New. Engine Lathes, 23 in. swing, 10 ft. bed. 2d hand. Engine Lathes, 19 in. swing, 7 ft. bed. 2d hand. Engine Lathes, 14½ in. swing, 6 ft. bed. 2d hand. Lot other sizes, 20, latest and new. Iron Planer, 36 in. x 36 in. x 9 ft. 2d hand. Iron Planer, 32 in. x 32 in. x 9 ft. 2d hand. Iron Planer, 36 in. x 36 in. x 13 ft. New. Lot other sizes, 20. Write for Circular.

J. M. BADGER,
5 Day St., New York City.

For Sale.

One Bigelow Horizontal Tubular Boiler, 42 in. x 12 ft. One Stationary Engine, 8 x 24, 7 ft. fly-wheel, built by Francis E. Smith, Springfield, Mass. Also, good Power Pump and Heater. The above for delivery about January 1st. Will be taken out to be replaced by larger. All are in good running order, and can be seen at our works.
SESSIONS FOUNDRY CO., Bristol, Conn.

For Sale.

A small lot of sixteen and twenty and forty to forty-five pound Iron Rails, fit for relaying.
SITES & GILL,
222 & 224 So. 3d Street,
Philadelphia.

A Young Man,

21 years of age, desires a position with a good Hardware House, city or country. Has had four years' experience in the business, and can furnish first-class references from present employers.

Address T. J. J.,
Office of The Iron Age, 220 So. 4th St., Phila., Pa.
WANTED.—A position by a first-class Hardware Salesman, Traveler and Bookkeeper, with a large trade, known and traveled all over the U. S. Best testimonials. Moderate salary.
Address ACTIVE,
56 East 131 St.

WANTED.

A Young Man who has had some experience as Entry Clerk, in the Hardware Business.
Address P. O. BOX 1462,
New York City.

WANTED.—A mechanical engineer, experienced in rolling mill work, for a large iron and steel works in the West. The engagement will be permanent for a competent man. Address J. J.,
Office of The Iron Age, 23 Reade St., New York.

WANTED.—A thorough Salesman well acquainted with the consumers of Cast Steel in the Eastern and Middle States. State age, time engaged in the business, experience and salary expected. Address replies to S. J.,
Office of The Iron Age, 23 Reade St., New York.

Special Notices.

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DAVID WILLIAMS,
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53 Reade Street, New York.

Wanted.

By a gentleman of ability and approved character, who has held responsible positions, and will be open for an engagement January 1, 1883, a position as salesman or business manager, in posted in general hardware, ship chandlery hardware, sheave, bushing and wrought iron vise business, having twelve years' experience as jobber and manufacturer, and would like to connect himself with some concern in similar business. Could invest, if desired, a few thousand dollars in a sure and good thing, where the man is needed more than the money. No objection to leave city. Undoubted references given if required.
Address I. H.,
P. O. Box 247, New York City, N. Y.

Wanted,

A salesman who is well acquainted with the Western and Northern Hardware Trade, from January, to travel for a Manufacturer of Hardware Specialties. Address
"SPECIALTIES,"
Office of The Iron Age, 23 Reade St., New York.

Wanted.

By a Tin Plate and Metal Importing House, on January 1, 1883, a reliable traveling salesman, unmarried.
Address, with references,
P. O. DRAWER 93,
Philadelphia, Pa.

Wanted.

A traveling man who is carrying samples of Hardware, and can show that he has a good trade established, to correspond with us relative to selling our goods in any part of the United States.
Address SHEARS,
Office of The Iron Age, 23 Reade St., New York.

Wanted.

A traveling salesman acquainted with the Jobbing Hardware trade, West and South, to sell Fancy and Housefurnishing Hardware. Best references required. Engagement at 1st January. Address
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Office of The Iron Age, 220 So. 4th St., Phila., Pa.

Wanted.

An experienced Rolling Mill Manager, with \$25,000 to \$50,000 capital, to join party now operating a Puddling Mill in the erection of a Finishing Mill.
Address LOCK BOX 69,
Norristown, Pa.

FURNACE PROPERTY AT PUBLIC SALE.

The valuable property known as the Volcano Furnace, situated between the P. & W. & C. and W. & L. E. Railroads at Massillon, Ohio, consisting of a furnace in excellent condition, two Dwelling Houses, about 22 acres of land, with side tracks, and all necessary improvements, making it one of the most desirable and convenient Furnaces in the State, will be offered at public sale to the highest bidder, at the Court House in the city of Canton, Ohio, Dec. 23, 1882, at 1 o'clock P. M. Terms Cash. For further particulars address BALDWIN and SHIELDS, Attys., Canton, Ohio.

NOTICE.

To capitalist wishing to engage in the Hot Pressed Nut or Bolt Business, the undersigned wishes a situation as foreman; has had 20 years' experience in all its branches; is also prepared to build the improved Pittsburgh Nut Machine. Address
W. H. LEAHY, 473 Penn Ave., Pittsburgh, Pa.

WANTED.—A gentleman with over twelve years' experience at the Hardware trade, for the past few years representing one of the first houses in Chicago, wishes to make an engagement with a live Eastern house to represent them in West. Address, E. C. C., care C. H. Fuller, 69 Dearborn St., Chicago, Ill.

DRAUGHTSMAN WANTS SITUATION.—16 years' experience; all classes of heavy work; practical man; best character and references.
J. L. W., 55 Jerusalem St., Brooklyn.

WANTED.—Situation as Superintendent of a Works for Malleable Castings. References to be obtained from
GOTTFRIED LUNDBERG,
22 Auburn Street,
Worcester, Mass.

WANTED.—A first-class Western Hardware man will be open for an engagement before January 1. Competent to assume any position—manager, buyer or otherwise. Fifteen years' experience. Best references. Address
C. B., 788 Walnut St., Chicago, Ill.

WANTED.—From January next, a traveling salesman who can sell a good trade in the larger cities east of the Mississippi, for Fine Pocket Cutlery, &c. Only one who has a thorough knowledge of the trade need apply, with best references. K. E.,
Office of The Iron Age, 23 Reade St., New York.

DRILL PRESS FOR SALE.—New Upright Power return motion, steel spindle, superior finish; weight, 1100; height, 6 feet; price, \$2100.
FEELERS PUNCH AND SHEAR CO.,
36 W. Day St., New York.

Special Notices.

Engines For Sale.

HORIZONTAL.

One 36 in. x 48 in. 24 ft. Wheel, 30 tons.
One 30 in. x 48 in. 20 ft. Wheel, 20 tons.
Two 30 in. x 48 in. connected together.
One 24 in. x 48 in. 20 ft. Wheel, 20 tons.
One 22 in. x 36 in. 20 ft. Wheel, 20 tons.
One 20 in. x 48 in. 18 ft. Wheel, 18 tons.
One 20 in. x 48 in. Corliss 16 ft. Hand Wheel, 26 in.
Two 20 in. x 48 in. Corliss 16 ft. Gear, 4½ Pitch, 16 in. Face, with Jack Gear and Shaft.
Two 18 in. x 48 in. Link Motions.
One 18 in. x 48 in. Corliss 17 ft. Hand Wheel.
18 in. x 16 in. Wright 12 ft. Hand Wheel.
17 in. x 30 in. Slide Valve 10 ft. Hand.
12 in. x 30 in. Todd & Rafferty.
12 in. x 48 in. Greer Engine, 11 ft. Hand Wheel.
Two 12 in. x 16 in. Slide Valve Engines.
16 in. x 16 in. 20 in. x 20 in. 24 in. x 26 in. and 30 in. x 48 in. Vertical Engines. Also a Pair 26 in. x 30 in. with Link Motion, all in perfect order.
JOHN CARROLL,
261 and 263 Water Street.

Factory to Rent.

Three substantial and convenient brick buildings, containing about 50,000 square feet, situated at Bridgeport, Conn., and within five minutes' walk of the depot. Each building fronts on the street, thus securing excellent light and ventilation. Gas throughout. Two of the buildings are fitted for steam heat. A 40-horse-power engine (almost new), with boiler, shafting, &c., will be rented with the property, or sold, if desired. Large natural supply of water (besides the city supply) on the premises. Elevator, fire escape, fire-proof vaults and other advantages, making it an exceedingly desirable property for manufacturing purposes. Will lease the entire plant or either building, and if but a portion is leased, arrangements can be made for heat and power, if needed. Cheap and convenient freighting facilities. Apply to
THOMAS STIRLING,
Bridgeport, Conn.

36 INCH

DRILL PRESSES

READY FOR DELIVERY.

HOBBS & HARRINGTON,

426 North 23d Street,

PHILADELPHIA, PA.

GOVERNMENT HOSPITAL FOR THE INSANE,
WASHINGTON, D. C., Dec. 5th, 1882.

Proposals for Laying a Water-main from Washington, D. C., to the Government Hospital for the Insane, across the Eastern Branch of the Potomac River.

Sealed proposals are invited for laying an eight (8) inch water-main from the grounds of the Washington Barracks, at Greenleaf's Point, to a point on the grounds of the Government Hospital for the Insane. Further particulars and profile of the river can be obtained by addressing the undersigned. Proposals should be sealed, marked "Proposals for laying Water-main," and addressed to the "Superintendent of the Government Hospital for the Insane, Washington, D. C." All proposals received will be opened at noon, January 4th, 1883. The right to reject all bids is reserved.
W. W. GODDING,
Superintendent.

E. BISSELL & CO.,

Wholesale Hardware Auctioneers,

53 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and Importers.

Removal.

JOSEPH J. LIPPINCOTT & CO.,

dealers in Scrap Iron, have removed from No. 115

South Fourth street to No. 131 South Fourth street, Philadelphia, Pa.

Wanted.

A First-class Traveling Salesman

for large cities West and Southwest, to sell Fancy and Upholsterers' Hardware. Must be a tip-top man, with long experience and good reference. State salary expected and per diem expenses. No trunk to carry.

Address
PICTURE NAIL,
Office of The Iron Age, 23 Reade St., New York.

Wanted.

Partner with \$3000 to \$5000, to take one-half interest in an old and well-established Hardware, Stove and Implement Business in a town of 3000 inhabitants in Northwestern Ohio, where there is but very little competition. The business this year will amount to over \$75,000. I have two reasons for taking a partner. One is I am too much business for one man; the other is, I wish to increase the trade to \$100,000 during the year 1883. No one need apply unless they understand the Hardware trade thoroughly, and is a live and energetic man, and can come well recommended. Address,
LOCK BOX 372, Lebanon, Ohio.

Wanted.

Respectable and active agents to introduce and push sale of new Welding Leaves and Powder. Superior to anything yet known.

Apply
A. CLAVEL,
33 Rue Beaupaire,
Paris.

CORRESPONDENCE IS SOLICITED

with parties having
MACHINERY TO BUILD,
Heavy work preferred.

Address
THE HARTFORD ENGINEERING CO.,
Hartford, Conn.

A MAN OF EXPERIENCE and acquaintance with the Iron and Steel business in Chicago and the West, and now actively engaged in a Western office of a large Manufacturing Co., is open to an engagement as representative of a Rolling Mill or Iron and Steel Manufacturer with office at Chicago. Unquestionable reference can be furnished. Address E. E.,
Office of The Iron Age, 38 Clark St., Chicago, Ill.

Special Notices.

H. W. JOHNS'

Asbestos Air Chamber Covering.

Consisting of Asbestos Sheathing or Lining Felt, combined with Hair Felt, for covering Steam Pipes and other heated surfaces, is patented, and infringers will be prosecuted to the full extent of the law.

H. W. JOHNS MFG. CO.,

87 Maiden Lane, New York.

For Sale.

Palo Alto Rolling Mills,

Near Pottsville, Pa.,

ON THE MAIN LINE OF THE POTTSVILLE AND READING RAILROAD.

These mills are in good repair, and can be started in two days' time.
Rolls for T-Rails 12 to 70 lbs. per yard, and for Street Rails 18 to 70 lbs. per yard.
Guide Mill Train for Merchant Iron ½ to 1 inch. Rolls for Merchant Bar, round and square, up to 4½ inches.
Number of Puddling Furnaces, 30; Heating Furnaces, 9; all with boilers attached. Also Foundry, Machine Shop, Blacksmith Shops, Iron House, Roll House, Carpenter and Pattern Shops, Stables, handsome Dwelling for Superintendent, 11 Tenement Houses, a Brick Office, and ample grounds for stock and cinder.
For further particulars address
Messrs. LEE & McCAMANT, Extrs.,
Pottsville, Pa.

THOS. F. WRIGHT, 1804 Race St., Philadelphia, Pa.
HUGH W. ADAMS, 56 Pine St., New York.

For Sale.

Rolling Mill & Nail Factory on P. R. R.
Eight single Puddling Furnaces.
Three Heating Furnaces.
One 16 in. Bar Mill Train.
One 8 in. Guide Mill Train.
One Rotary Squeezer with Muck Mill.
One Nail Plate Mill.
Brick Nail Factory, with 20 Nail Machines, iron and Nail Warehouses, &c.
The above works are now running on both day and night turns, and have been in successful operation for a number of years. Property must be sold to close an estate. For further information address
ADMINISTRATOR,
Office of The Iron Age, 23 Reade St., New York.

Manufacturing Property for Rent.

A very desirable location for manufacturing purposes, situated on the line of the Pittsburgh and Lake Erie Railroad, to wit miles west of Pittsburgh. A substantial building, two stories, 80 x 200 feet, supplied with a first-class water power. The facilities for shipping to all parts of the United States are unsurpassed. To a desirable tenant liberal arrangements will be made.
For further information apply to
W. F. J. WISEND & CO.,
21 Market St., Pittsburgh, Pa., or New Brighton, Pa.

NEW MACHINE TOOLS, &c.

27 in. x 26 in. Planer, planes 7 ft., with chuck, \$750.
16 in. x 6 ft. Engine Lathe, rod and screw, with power, cross feed and 6 in. chuck, \$375.
20 in. swing Upright Drill, latest design, \$175.
6-spindle Nut Tapper, complete—a boy will tap 16,000 nuts per 10 hours—\$200.

AMERICAN TOOL CO.,

CLEVELAND, OHIO.

JOHN A. MOHR

HAS THE BEST

DOOR SPRING PATENT

ON EARTH

FOR SALE.

PONCA, - - NEBRASKA.

For Sale, Cheap.

A complete stock of Hardware, Stoves and Implements, in one of the best towns in Central Illinois. A good trade established; yearly sales \$40,000. Address
C. G. W.,
Office of The Iron Age, 23 Reade St., New York.

For Sale.

THE REHOBOTH FURNACE,
Located at Iron Station, N. C., on the line of a leading railroad. In connection with the furnace is a large tract of land, containing 100 acres of Charcoal Pig Iron per day, which will cost not over \$1 per ton. It is a very tough, strong iron, suitable for car wheels or any other work where strong iron is required. Charcoal in abundance at 5 cents per bushel. Labor from \$1 to 75 cents a day; cost of ore \$2 per ton, delivered at furnace; two tons of ore make a ton of pig iron. For further particulars address
JOHN LEONARD & CO.,
445 West St., New York.

For Sale.

One 6 ton Anvil Block and Die. Also pair Power Shears, suitable for ¾ in. iron.
J. H. KOLLE,
North 10th and 5th Sts., Brooklyn, E. D., N. Y.

Wanted.

A Partner with \$3000 to \$10,000 in a Foundry and Machine Business, established in 1824. For particulars, inquire of
I. H. COLLIER,
Poughkeepsie, N. Y.

IRON AND METAL

Exchange Memberships

Bought and Sold by
WM. WILLIS MERRILL,
4 Stone Street, Room 6p.
Dealer in
EXCHANGE MEMBERSHIPS.

To Brass Foundries.

Our new foot press, for cutting off GATES from brass castings by FOOT power, is now ready. Weight, 250 lbs. Price complete, \$500. Ask. A boy can operate it easily. We warrant them to give the most perfect satisfaction. FREELESS PUNCH AND SHEAR CO.,
36 W. Day Street, New York.

Special Notices.

NEW IRON WORKING MACHINERY.

ENGINE LATHES.

38 in. triple geared (bed to suit), Fitchburg.
28 in. swing, 18 foot bed. Fitchburg.
24 in. swing, 14 and 16 foot bed. Fitchburg.
21 in. swing, 12 and 14 foot bed. Blaisdell.
20 in. swing, 12 foot bed. Fitchburg.
20 in. swing, 12 foot bed. Field.
19 in. swing, 10 and 12 foot bed. Gray.
18 in. swing, 10 and 12 foot bed. Blaisdell.
17 in. swing, 6 foot bed. Johnson.
16 in. swing, 6 and 8 foot bed. Fitchburg.
15 in. swing, 6 and 8 foot bed. Fitchburg.
13 in. swing, 6 and 8 foot bed. Blaisdell.
No. 2 Cabinet Turret Lathe, 18 in. by 6 ft.
No. 1 sq. Arbor Lathe, 14 in. by 5 ft.
No. 2 and 3 sq. Arbor Lathes.

PLANERS, SHAPERS & SLOTTERS.

36 in. x 36 in. x 9 foot Planer (ad hand); good order
Wheeler.
30 in. x 30 in. x 8 foot Planer. Fitchburg.
26 in. x 24 in. x 5 and 7 ft. Planer. Wheeler.
25 in. x 25 in. x 8 foot Planer. Fitchburg.
22 in. x 20 in. x 4 foot Planer. Wheeler.
14 in. stroke Shaper. Gould & Eberhardt.
10 in. stroke Shaper. Gould & Eberhardt.
10 in. stroke Shaper. Fitchburg.
12 in. Slotter (swing 56 in.) Hewes & Phillips.

DRILL PRESSES.

48 in. Radial Drill, double geared, self-feed, slow and planed bed. Betts.
30 in. back geared, automatic, Prentice.
25 in. back geared, self-feed, Fitchburg.
25 in. quick return. Blaisdell.
19 in. quick return. Blaisdell.
18 in. quick return. Fitchburg & Blaisdell.
4 and 4 spindle drills. Garvin.
No. 2 (¾ x 1½) Bolt Cutters. Merriman's.
Power and Hand Millers. Garvin.
These tools are on hand and for quick delivery.

KELLY & LUDWIG,

49 and 51 North 7th St.,
PHILADELPHIA, PA.

For Sale. Rolling Mill,

At CINCINNATI, OHIO.

Single Puddling Furnaces.

Scraping Furnaces.
Heating Furnaces.
New 8 in. Hoop Train.
16 in. Sheet Train and Annealing Furnace.
Compound Muck and Bar Mill.
Engines, Boilers and Fixtures complete.
Grounds, 300 x 120.
Annual capacity, single turn, 5000 tons. Will sell machinery and fixtures, and secure favorable lease or sale of grounds.
Cincinnati is one of the largest hot markets in the country, and there is no other hot mill in the city.
Address,
P. O. BOX NO. 297,
CINCINNATI, O.

For Sale.

BOLT HEADERS.

One Burdick Header.
One Improved Lewis, Oliver & Phillips style.
Two Chapin Headers.
Five National Headers.
National Hot-Pressed Nut Machine.
And complete outfits for Bolt and Nut manufacture. Apply
NATIONAL MACHINERY CO.,
Cleveland, Ohio.
Specialists in this line of machinery.

For Sale.

Stanhope Furnace, and a Farm of 140 acres, with 20 dwellings, houses, barns, &c., &c. Capacity of Furnace 150 tons per week. Was thoroughly overhauled in 1880, and was in blast but two months in 1881. Inquire of
THOMAS COOCH,
Pottsville, Pa.

FOR SALE.

1 Horizontal Engine, 12 x 24.
1 Horizontal Engine, 12 x

METALS.

Copper.—Sales for the week have been limited to 50,000 pounds Lake Superior at 18¢ @ 18½¢ in small parcels, the market closing dull at 18¢ for Lake and 17½¢ for "Anchor" brand and Baltimore. Copper, in common with other metals, will remain dull till the report of the Committee of Ways and Means, now examining the duty modifications proposed by the tariff commissioners, shall have been passed upon by Congress. London came yesterday with Chili Bars £65. 10/ and with Best Selected £72. 10/. We have received from there this afternoon the ensuing cablegram: "Market active, with large inquiry. Prices firm. Best Selected, £72 @ £73; Chili Bars, £65. 5/ @ £65. 15/." Manufacturers have made no change in prices. They quote: Bottoms, 31¢ @ 32¢; Braziers, 30¢ @ 30½¢; Circles, 33¢ @ 36¢; Sheathing, 28¢; and Bolt Copper, 30¢; Segment Sheets, 33¢; Fire-box do., 30¢.

Tin.—The unsettled state of the market here and in Europe continues, London being cabled last night £93. 15/ @ £94, and Singapore \$30 7/8 picul. To-day we are cabled to the following effect: "No improvement to note, the market ruling dull, with prices weak and lower. Straits, spot, £94 @ £94. 10/; futures, £95. 10/." Here it is not easy to get 2½¢ for large lots of Straits, while in a jobbing way 2½¢ is asked. L. and F. is scarce, and would probably bring something like 23¢. The interest in the Metal market has centered just now on Coke. Tin Plates.—As predicted by us in our last report, half a dozen makers in Wales have failed, some of them large producers of Coke Tin. This will not only cut off a notable portion of the Coke Tin supply from Wales for a time, but the collapsed concerns cannot now deliver the Coke Tin they sold at low rates, and there is little probability that the purchasers will get them. Meanwhile the latter, in England, have had to cover those contracts they resold, which has led to an advance over there of 1/ @ 1½¢ per box on Coke Tins. The demand in New York being light for the moment, those in need of Coke Tin Plates are as yet unwilling to pay the advance asked, but it will probably not last long, and they will have to subscribe to it. Liverpool quoted Charcoal last night, 18/6 @ 20/, and Coke, 15/6 @ 16/6. We receive from London this afternoon the following dispatch: "Early in the week a large business was done. At the close, however, the market is dull, with prices nominal." We quote at the close large lines, ordinary brands, 7/ box: Charcoal Bright, \$6 @ \$6.25; do. Ternes, \$5.20 @ \$5.35; Coke Tin, \$5.10 @ \$5.25, and do. Ternes, \$5.

Lead.—The Chicago party who has been such a free seller of lead on this coast, for account of the melting works he represents, has at length stopped doing so, allowing the market here to take breath, while at St. Louis the weakness still seems to be great. Here 300 tons sold in lots at \$4.55 @ \$4.60; now Common Lead is held at \$4.62½ @ \$4.65. Of Refined, 200 tons sold at \$4.65, which is the figure still at the close; Corrodors only operate sparingly and with hesitation, pending the tariff question. St. Louis has, as we said, been very much depressed, for Hard has declined there to 4¢, and Soft to \$4.10, to which 4½¢ freight this way would have to be added. From London we receive the following message per cable: "Market quiet and prices steady. Common English Pig, £13. 17/6." Manufacturers are quoted as follows: Lead Pipe, 6½¢; Sheet Lead, 7½¢; Tin-lined Lead Pipe, 15¢ per lb, and Black-Tin Pipe, 45¢, less the usual discount to dealers.

Spelter and Zinc.—There has transpired very little in the way of sales during the week at 4½¢ @ 5¢ for Common Domestic, which is the closing figure as to quantity, while foreign is worth 5½¢. We perceive from St. Louis papers that it has been divulged in some manner that for some time past the La Salle Zinc Works have utilized to great advantage the sulphur fumes escaping from their furnaces while treating black-jack blende, making therefrom sulphuric acid, and that capitalists have in consequence combined to purchase and consolidate at least four of the works at St. Louis, and perhaps some elsewhere out West, with a view to following in the footsteps of the La Salle people. Should these plans be realized, Spelter could be produced cheaper in this country than at present, and production would besides be stimulated. It will, of course, take some time ere all this can be accomplished and can have any effect on prices, but at any rate we do not leave it unmentioned, since at no time has Spelter and its future attracted the solicitude of the metal trade perhaps as much as at present, and anything bearing on a prospect of increased domestic supply is read with particular interest. From London we are cabled to-day as follows: "Market quiet, with fair business doing. Ordinary, at shipping ports, £16. 12/6." We quote Bertha Refined 8½¢, and Bergenport 9½¢. Sheet Zinc.—Freight from Chicago this way has been raised 10¢ per 100 lb, which rather stiffens the market here. We quote Domestic 6½¢ @ 6¾¢.

Antimony.—Increased activity has been noticeable in Cookson's at 12¢ @ 12½¢, while Hallett has remained moderately active at 10½¢.

FOREIGN TRADE MOVEMENTS.

The following is a summary of foreign trade movements during the past week:

IMPORTS.			
For the week ended December 8:			
1882.	1881.	1880.	
Total.....	\$7,402,292	\$6,793,543	\$6,921,489
Prev. reported.....	443,143.485	476,471.706	494,095,299
Since Jan. 1.....	\$450,545,777	\$413,405,349	\$458,926,758

Included in the imports were articles of merchandise valued as follows:

Pkgs.	Value.
Antimony.....	\$13,607
Asbestos.....	15
Brass goods.....	25
Brass rods.....	4
Chains and anchors.....	4
Clocks.....	4

Copper.....	318
Cutlery.....	93
Gas fixtures.....	36,746
Hardware.....	99
Iron, pig, tons.....	5,410
Iron, sheet, tons.....	178
Iron, ore, tons.....	10,106
Iron, other, tons.....	2,003
Machinery.....	688
Metal goods.....	127
Nails.....	1
Needles.....	18
Nickel.....	10
Old metal.....	7,431
Platina.....	1
Platedware.....	3
Pins.....	2
Saddlery.....	10
Steel.....	30,899
Steel blooms.....	3,294
Spelter, lbs.....	66,239
Silverware.....	11
Tin, boxes.....	21,724
Tin, slabs, 387 pkgs.; lbs.....	447,808
Wire.....	157
Zinc, lbs.....	31,101

As reported by the Custom House, the imports of leading articles compare as follows:

For the 49 weeks	Same
week of 1882.	time 1881.
Cutlery, pkgs.....	6,767
Hardware, pkgs.....	28
Iron, R. R., bars.....	92,266
Lead, pkgs.....	30,461
Steel, pkgs.....	30,899
Tin, boxes.....	21,724
Tin slabs, lbs.....	447,808

EXPORTS OF SPECIE.

For the week ended December 9:			
Total.....	1882.	1881.	1880.
Previously reported.....	\$215,642	\$215,642	\$215,642
Total since January 1, 1882.....	\$45,422,912	\$45,422,912	\$45,422,912

Same time in 1881..... \$45,422,912

Same time in 1880..... \$45,422,912

Same time in 1879..... \$45,422,912

Same time in 1878..... \$45,422,912

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Same time in 1803..... \$45,422,912

Same time in 1802..... \$45,422,912

Same time in 1801..... \$45,422,912

Same time in 1800..... \$45,422,912

Same time in 1799..... \$45,422,912

Same time in 1798..... \$45,422,912

EXPORTS.

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending Dec. 12, 1882:

Dutch West Indies.

Quant. Val.

Clocks, pkgs. 1 38

Plum, gals. 4585 491

Hamburg.

Hdw, pkgs. 26 1,137

Mach'y, pkgs. 16 1,530

Sew. ma., cs. 778 9,979

Clocks, pkgs. 30 770

Ag. imp. pkgs. 31 700

Knit. ma., cs. 1 575

Bremen.

Plum, gals. 500,333 129,699

Hdw, pkgs. 143 3,243

Mf. iron, pkgs. 22 693

Ag. imp. pkgs. 29 1,494

Saws, cs. 1 304

Antwerp.

Plum, gals. 484,500 38,760

Sew. ma., cs. 70 1,200

Hdw, cs. 21 506

Mf. iron, pkgs. 1 14

Rifles, cs. 2 826

Empty shells, case 1 29

Amsterdam.

Bells, bxs. 3 60

Hdw, cs. 4 100

Copenhagen.

Mf. iron, pkgs. 5 125

Gas burners, bx 1 59

Hdw, cs. 4 181

Rotterdam.

Mf. iron, pkgs. 10 58

Gas burners, bx 1 59

Hdw, cs. 4 181

Ant.

Ag. imp. pkgs. 2 148

Hdw, cs. 44 946

Liverpool.

Pumps, pkgs. 71 747

Hdw, pkgs. 71 747

Mach'y, pkgs. 21 1,900

Sew. ma., cs. 801 1,573

Mf. iron, pkgs. 4 112

Ag. imp. pkgs. 1 83

Stumpwre, cs. 10 300

Cop. mat. bgs. 138 18,000

Steel, cs. 2 78

Br. goods, case 1 225

Cutlery, cs. 9 530

Clocks, pkgs. 109 4,734

Cop. ore, bags 473 5,084

W. mills, pgs. 17 587

London.

Clocks, pkgs. 518 16,111

Pumps, pkgs. 6 993

Eyeteels, cs. 1 124

Mf. iron, pkgs. 7 105

Ag. imp. pkgs. 74 1,057

Steel, cs. 5 197

R. R. cars, 1 1,970

Cartridges, cs. 3 83

Brass g'ds, cs. 31 1,850

Mf. iron, pkgs. 26 13,300

Sew. ma., cs. 2 248

Saws, cs. 7 395

Hdw, pkgs. 195 5,217

S. rollers, cs. 11 377

Glasgow.

Mach'y, pkgs. 5 730

Or. sine, bbls. 100 9,005

Gibraltar.

Plum, gals. 124,500 15,250

Rifles, cs. 1 31

British East Indies.

Plum, gals. 500,000 50,500

British North American Colonies.

Plum, gals. 600 645

Mf. iron, pkgs. 11 150

Ag. imp. pkgs. 4 23

article and the products, is confidently looked for, and there is no reason apparent at present why these expectations should not be realized. The building of railroads, bridges and public and private buildings in 1883, all of which require large quantities of iron, promises to exceed that of 1882, and within the past week there has been an increased inquiry, although it is not to be expected that many large contracts will be closed in December. Advances from the South and West are of a most encouraging character.

In regard to the report of the Tariff Commission, there is, as might be expected, some dissatisfaction, chiefly on the part of Steel Rail makers. Iron manufacturers generally express themselves satisfied. Some of them say that they would like Congress to accept it without modification. There is reason to believe, however, that the Steel Rail manufacturers will resist its enactment as regards Steel Rails, claiming, as they do, that the proposed reduction in the duty on Rails is entirely too great. That the Commission have given the work committed to their charge great consideration is evident from their very full and elaborate report; that it would please every one was not to be expected.

Pig Iron.—There has been more activity the past week, the reported sales aggregating some 6000 tons, and, as might be expected, a more confident and firmer feeling has been developed, and for the present, at least, the downward turn has been arrested; moreover, some furnaces who have unfinished contracts are refusing to make any new ones at current prices. It is admitted on all hands that the margin for profit at prevailing rates is small, under the most favorable circumstances; also that for the present the cost of production has been reduced to the lowest possible limit. Cheaper ores are looked for next year, but this does not avail the furnaces anything at present. There would be no trouble in placing a good deal of iron for future delivery at present prices, if consumers could only satisfy themselves that the market had touched hard pan; one firm stated within a day or two that they were prepared to contract for 5000 tons whenever there was good evidence of the market having touched the lowest notch. Prices may be fairly quoted as follows: Standard brands of Neutral Forge, \$21.50, 4 mos.; Mottled and White, \$19 @ \$20; All-ore Forge, \$22.50 @ \$23; Foundry grades, \$22.50 @ \$23.50 for No. 2, and \$24 @ \$25 for No. 1. Sales of Cold-blast Charcoal at \$32 @ \$39, and Hot-blast do. at \$27 @ \$30.

Bessemer Iron.—We can report sales at our reduced quotations of a week ago of some 2500 tons, as follows: 1500 tons at \$24.50, 4 mos.; two lots of 500 tons each at \$24, 4 mos.; and a small lot, probably for foundry use, at \$25. For round lots \$24, 4 mos., may be regarded as the ruling price for immediate delivery.

Manufactured Iron.—Manufacturers generally appear to be in better spirits than they were a week ago. The prospect for the incoming year is more promising; there is an increasing inquiry, and the belief obtains that there will be plenty of orders next month. An Eastern broker, toward the close of last week, tried to place a large order, but it appears that he was unable to get any of the mills to take it at the price to which he was limited. One of our mills closed a large contract for Bridge Iron recently, and, as already stated, the belief is gaining ground that there will be plenty of business next month, as the low prices will tend to stimulate the consumption and bring it up to the standard of production. We continue to quote prices on a basis of 2.20¢ @ 2.25¢ rates for Merchant Bars.

Nails.—Notwithstanding the season is usually over before this, the factories still have about all they can do. In addition to unfinished orders, there are still some new ones coming forward, and it is very evident that our manufacturers will close the year with little or no stock. Prices remain unchanged at \$3.40, 60 days, 2¢ off for cash, with the usual abatement of 10¢ per keg on carload lots and upward.

Wrought Iron Pipe.—Business continues rather quiet, as is usual at this season, and there is not likely to be much improvement in the demand until the spring trade opens up. Prices remain unchanged: Discounts on Gas and Steam Pipe, 65¢ @ 67½¢; on Boiler Tubes, 52½¢ @ 55¢ off.

Old Rails.—American T's are offered here from the West at \$29, delivered in Pittsburgh, and it is believed that an offer of \$28.50 would be accepted. No sales reported. Double-heads can be laid down here from the seaboard at about \$32. It is very evident that rails are weaker, and the belief obtains that the offerings of American will be unusually large next year, as the extremely low price of Steel Rails will, it is believed, cause many railroad companies to take up their old Iron Rails and replace them with Steel.

Steel Rails.—Manufacturers continue to quote for near-by delivery at \$42, cash, at mill, and, so far as we can learn, there have been no sales here below this figure. As stated in our last report, there is a good deal of dissatisfaction on the part of Western manufacturers at the proposed reduction in the duty on foreign make recommended by the report of the Tariff Commission, and it is intimated that it will be resisted in Congress. That the low price will largely increase the demand is very evident, and the mills will, no doubt, soon have all they can do.

Steel.—At the meeting of the Steel manufacturers in New York recently, the only change made in the price list was in table cutlery Steel, plain being reduced from 7½¢ to 7¢, and beveled from 8½¢ to 7½¢. There is a fair business, with prospect of it being considerably increased early next year.

Railway Track Supplies.—There is nothing new to note; business only fair; prices unchanged. Railway Spikes, 3¢, 30 days; Splice Bars, 2.50¢; Track Bolts, 3¼¢, with square and 3.90¢ @ 4¢ with hexagonal nuts.

Scrap.—Some small sales of Wrought Scrap reported at \$28 @ \$30 per net ton, the outside figure for selected Railway Scrap; Old Car Axles, \$38 @ \$40; Wrought Turnings, \$20 @ \$21; Steel Rail Ends, \$25.50 @ \$26 per gross ton, but firm at the decline;

Cast Borings, \$15 @ \$16, gross. Nothing doing in Car Wheels.

Coke.—Business is still restricted for want of transportation, although the demand is not as urgent as it was some time ago. It seems utterly impossible for the railroads to meet the wants of the Coke men during the fall and winter. Prices remain at \$1.35 per ton in a regular way, free on cars at ovens, and \$1.50 @ \$1.60 for small orders.

CHICAGO.

Office of The Iron Age, 36 and 38 Clark Street, cor. Lake Street, CHICAGO, December 11, 1882.

Hardware.—We have no change to note in this market; quotations are generally maintained, while trade continues fair. Nails are in good demand at our former figures, viz: \$3.75 per keg for 10d @ 60d, with usual discounts for cash and carload lots.

Manufactured Iron.—The demand continues good, and without any change in prices. We quote: Merchant Bars, 2.50¢ @ 2.70¢; Angle, 3.50¢ @ 4¢; T, 4¢; Beams and Channels, 4¼¢ @ 4½¢; Hoop, 3.60¢ @ 6¢; Sheet, Plate and Tank, 3.50¢ @ 3.80¢; Norway Iron, original bars, 4¼¢ rates; Norway Iron, re-rolled, 5¼¢ rates; Ulster, 4½¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 8¢ off list; Wrought Boat Spikes, 3¼¢ rates.

Pig Iron.—As previously reported, soft Irons are firm and in good demand, with light stocks in dealers' hands. Poorer grades of Iron are not in good request, and are about the only class of Iron upon which concessions are made. Scotch imported remains firm and scarce at \$31.50. Otherwise we have no change to report, and quote: Lake Superior Charcoal, Nos. 1 and 2, \$26.50; No. 3, \$27, and Nos. 4, 5 and 6, \$28, 4 mos.; Calumet, \$24.50 @ \$25, 4 mos.; Briar Hill, \$26.50, 4 mos.; Silvery Soft, \$23.50 @ \$24.50, 4 mos.; Crane No. 1, \$27.50; No. 2, \$26.50, 4 mos.; Himrod, \$25.50, 4 mos.; Thomas, \$27.50 @ \$28.50; American-Scotch, \$24 @ \$25, 4 mos.

Steel.—We have no change to report in the Steel market, which is fair, and quotations remain firm. We quote: Tool, 12¢; Machinery O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 7¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢; Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¼¢; Eagle Plow, 5½¢; Iron Center Plow, 10¼¢, and Soft Steel Center Plow, 10¼¢.

Scrap Iron.—Market remains unchanged, being dull and weak. We quote (dealers' purchasing prices, which are nominal): No. 1 Wrought Scrap, \$21 @ \$22, net ton; No. 1 Railroad Scrap, \$23 @ \$24; do. Heavy Cast, \$17; do. Stove Plate, \$11; do. Cast-iron Borings, \$7 @ \$8, and co. Machine shop Turnings, \$10 @ \$11.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., CHATTANOOGA, Dec. 11, 1882.

Trade is rather dull. There is but slight stir in lines specially affected by the holidays. The weather has been intensely cold during the latter half of the week, and so unfavorable to outside work that not much of the little doing was attended to. The week closes with warmer weather and prospects of rain.

Pig Iron.—There is nothing new to report. There is a good deal of business in a small way, but nothing indicates what the market will open at with the new year. There is little or no Car-wheel Iron being made in the South. We quote: No. 1 Foundry, \$24 @ \$25; No. 2 Foundry, \$22 @ \$23; Gray Forge, \$20 @ \$21; White and Mottled, \$19 @ \$20; Car-wheel Metal, \$33 @ \$37.

Ores.—We quote: 50 % Brown Hematite, 7¢ ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are rather slow at \$25. We quote: Scraps, dull; Wrought at \$23; Cast Scrap, \$13 @ \$15; Old Wheels, \$28 @ \$29.

Nails.—Are strong at \$3.40, at mills, for large bills. Small lots from stores 15¢ higher.

Manufactured Iron.—Mills find a fair market for their surplus over what they make to fill standing orders and old contracts. We quote: Bar, in large lots, nominal at \$2.50; Railroad Spikes, \$3.25; Track Bolts, \$4; Fish Plate, \$3.

Coal.—Best Lump, \$4.50; Common, \$3.50 @ \$4; run of mine, \$2, delivered at mills.

Coke.—We quote: Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails.—Steel Bars, \$45; Small T's, \$50 @ \$53.

LOUISVILLE.

MESSRS. GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of December 8, 1882: The market for Pig Iron is without special change. There is still a wide difference between the views of buyers and sellers. Otherwise several large sales could be effected. Iron for immediate delivery is becoming scarce, and the probability is that buyers will have to come to the views of sellers during the next 30 days. Car-wheel Irons continue dull.

FOUNDRY IRON.
No. 1 Hanging Rock Charcoal, \$27.00 @ 28.00
No. 1 Southern Charcoal, 24.00 @ 25.00
No. 1 Hanging Rock Stonecoal and Coke, 23.00 @ 24.00
No. 1 Southern Stonecoal and Coke, 23.00 @ 24.00
No. 2 Southern Stonecoal and Coke, 22.00 @ 23.00
American-Scotch, 22.00 @ 23.00
Open Silver Gray, 21.50 @ 22.00
Close Silver Gray, 20.50 @ 21.00

MILL IRON.
No. 1 Charcoal, 22.00 @ 23.00
No. 1 Stonecoal and Coke, Neutral, 21.00 @ 22.00
No. 2 Stonecoal and Coke, Neutral, 20.00 @ 21.00
No. 3 Stonecoal and Coke, Cold-short, 20.00 @ 21.00
White and Mottled, Cold-short and Neutral, 18.00 @ 19.00

CAR WHEEL IRONS.
Hanging Rock, Cold-blast, 30.00 @ 32.00
Hanging Rock, Warm-blast, 26.00 @ 27.00
Alabama and Georgia, Warm and Cold-blast, 30.00 @ 31.00
Central Kentucky, Cold-blast, 28.00 @ 30.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street,

report to us as follows, under date of Dec. 9, 1882: The market for finished Bars is gradually assuming its normal December quiet. Small lots are jobbing from store, but inquiries for large lots are scarce. Every one seems to be waiting to see what the new year, combined with Congressional efforts, will bring forth. From the confessed weakness of the market, it would really appear that a free-trade movement was already discounted. Whatever may be done in this direction by the present Congress, it is hoped will not be kept in suspense. A well-defined plan announced without delay would give each one something to work on, and not leave buyers and sellers in a state of uncertainty—a condition which is always most disastrous to business interests. The mill here has shut down, and the one in New Albany closes the latter part of this month—the latter, however, only for repairs, unless the market should be so unfavorable as to make it to their interest to stay out. A low river, combined with an extremely cold spell, is used as an excuse for an advance on Pittsburgh Coal, and those manufacturers not well supplied will be the sufferers in this particular. While the general situation is thus weakish, Bars cannot be had at much of a cut on previous prices; \$4 per ton will probably represent the total decline. Hoop is unchanged, being altogether in the hands of the association. Sheet is quoted lower, and the circulars issued by mills would go to show that stock was accumulating, particularly in the lighter gauges, which were exceptionally high all last autumn. Low-grade Steels are much demoralized, and also most of the articles into the manufacture of which they enter. The better grades of Cast Steel are unchanged. The manufacturers report full order books. Nails are still scarce, and the card is well sustained. Low water has not yet permitted liberal shipments from Wheeling; hence the lower-river Nail mills have been crowded for Southern and Western delivery. No soliciting is being done by the Nail mills. The scarcity is particularly manifest in the small sizes, from 6d. down, 4d., 3d. and 2d. fine being particularly difficult to obtain. Nuts, Washers, Spikes and Railroad and Contractors' Supplies in general are going off slowly. There is no prospect of much purchasing until after the 1st of January.

CINCINNATI.

DECEMBER 11, 1882.—**Pig Iron.**—The market in the past two weeks has been very quiet, all consumers evening up to the first of the year. The rolling mills and foundries report good orders on hand and in prospect, and the outlook is fairly good. Possible legislation affecting the tariff on Iron has influenced to prevent considerable transactions for future delivery, limiting them strictly to present needs. Sales in the past week have been made at about following prices: No. 1 Hanging Rock Charcoal, \$26.50 @ \$27; No. 2, 50¢ @ \$1 less; Southern Charcoal, \$24.50 @ \$25.50; Hanging Rock Coke Iron No. 1, \$23.50 @ \$24; Southern, \$23 @ \$23.50; No. 2, 50¢ @ \$1 less; American-Scotch, \$22 @ \$23.50; S. G. Softeners, \$22.50 for No. 1 to \$21 for Nos. 2 and 3. No sales of Forge Irons upon which to base quotations; held at from \$20 to \$24 for range of grades. Scrap Iron—Cast, light, 50¢ @ 70¢; heavy, 70¢ @ 90¢; Wrought, \$1 @ \$1.10 for light; \$1.10 @ \$1.40 for Country and No. 1; Old Rails, \$26.50; Old Wheels, \$24 @ \$25. Bar Iron, \$2.60 card rate; concessions are made for desirable orders.

ST. LOUIS.

MESSRS. HOFFER & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, report to us as follows, under date of Dec. 9, 1882: The season is so near its end that very little business for immediate delivery is doing. Some sales for delivery next year were made during the past week. We make no change in our quotations.

HOT-BLAST CHARCOAL.
Missouri, 21.00 @ 22.00
Ohio, 20.00 @ 21.00
Southern, 20.00 @ 21.00

COKE AND COAL.
Ohio, 23.00 @ 26.00
Southern, 24.00 @ 25.00
Missouri, 22.00 @ 23.00

MILL IRON.
Red Short, 21.00 @ 22.00
Neutral, 20.00 @ 21.00

CAR WHEEL AND MALLEABLE IRONS.
Missouri, 26.00 @ 28.00
Southern, 30.00 @ 32.00
Ohio, 27.00 @ 30.00

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Dec. 11, 1882: We have to report only a moderate trade during the past week. Values continue ruling weak and drooping at annexed figures:

Ref. Bar Iron, 1 to 6 x 3/4 to 1 x 1 1/2 @ 2 1/2-10¢
" " 1 to 4 x 1 1/4 to 1 x 1 1/2 @ 2 1/2-10¢
" " 1 to 4 x 1 1/2 to 1 x 1 1/2 @ 2 1/2-10¢
" " 1 to 4 x 1 1/2 to 1 x 1 1/2 @ 2 1/2-10¢
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" " 1 to 4 x 1 1/2 to 1 x 1 1/2 @ 2 1/2-10¢
" " 1 to 4 x 1 1/2 to 1 x 1 1/2 @ 2 1/2-10¢

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)
PARIS, Nov. 26, 1882.—**Metals.**—Confidence in public affairs, especially the finances, is still very much shaken. Metals have been inactive, but well sustained, with the exception of Copper. We quote, at the close, the latter: Chili Bars, 175 @ 178 7/8 francs per 100 kg.; Ingots and Slabs, 182.50 @ 185; Cu and Zn, 27. Feb. 27, 1882, and April 24, 1882, Tin—Banca, 271; Billiton, 260; Straits and Australian, 267.50, and English, 260. Lead, 34.75 @ 35.75, and Spelter, 43.50 @ 44. Iron.—Business in metal works for 1882 is the range of the year, and has been nominally maintained, but the lower advances from abroad have the effect of producing incipient weakness even in France. In the Ardennes not much transpires, all contracts being renewed; Coke Merchant remains steady at 19.50; Flooring at 19.50 @ 20, and Chais at 21.50 @ 22; Horse Nails, 70, 90, 95. In the Haute-Marne there is work for a couple of months to come; hence ac-

tivity reigns and prices are steady. In the Arriege the iron made competes to advantage with Swedish, remaining firm, while for the Southern railway and the ordnance department a fair amount of activity is kept up. Horse Nails are rather neglected within the range of 95 @ 120. At the North, rolling mills are doing tolerably well with Merchant Iron, while Sheets and large Plates are in less request. The high cost of all raw material keeps up prices. They quote in the district: Merchant Iron, 19 @ 20.50; Beams, 20 @ 23.50; Sheets, 23.50 @ 27.50, and large Plates, 20.50 @ 21. Hardware manufacturers at Avesnes are well provided with activity in the metal; Charcoal Merchant Iron is in good demand at 30 @ 31; Rods for Nails, at 32 @ 33. From St. Dizier we are informed that works are all busy, but have been hampered a good deal by the inundations which have flooded the country and inconvenienced every one of them. They have secured work all the way to June, so that nothing new occurs for the present in the way of dealings and contracts. The Chamouilly-Beaumont 3 has been rented and will resume operations early next year. In this city prices are decidedly weak at 19.50 for Merchant, and 20.50 for Beams; consumption has decreased, leading to fewer offers. Coal is firm, notwithstanding the large output; the fact is that inundations interfere very much with transportation, especially canal navigation.

BELGIUM.

(Moniteur Industriel.)
BRUSSELS, Nov. 26, 1882.—**Iron.**—Pig has been well sustained during the week, but finished has been decidedly easier; but at this shading quite a large business was done. Export orders continue dropping in to a fair extent; thus, a large order for railway cars has just been received. The State Railway has again reduced its freight rates on Rolled Steel intended for export. Old Rails have fluctuated between 2.50 and 2.90 francs. A great demand is noticeable for Steel Rails for Italy and France. We quote to-day: Merchant Iron No. 1, 13.75 francs per 100 kg.; Beams, 14.50; Rods, 15.25; Sheets, Nos. 2 to 10, 10.20; Steel Rails, 30 kg. to the meter, 16; Steel Hoops, 23.50; and do. Axles, 24.50. The lull in the Iron trade, accompanied by lower prices prevalent just now in neighboring countries, does not shake our confidence in the general position for the rest of the winter and the spring months. Crops in Europe have been fair, consumption is and will be large, money is not tight, nor likely to be so after the dividend disbursements on January 1 next. At the same time there is no apprehension of political complications, while railroad building and other public and private improvements have received no check, but will in all likelihood be as active in 1883 as they were in 1882. Iron prices cannot be called high as they are at present, for speculation has not meddled with them to any appreciable extent. In fact, the lull we now witness is due, we believe, to the dull season merely, pretty sure to disappear after we shall have fairly entered the new year. This at least seems to be the impression in this city, at Charleroi and Liege. Coal production has slackened on account of an insufficiency of mine hands, many of whom emigrate to America and the North of France, where they expect to do better than in Belgian mines where no advance in wages can be obtained. As the demand for all sorts of Coal is active, the tendency is under these circumstances one of great firmness. Metals are steady; we quote: Copper, 185 francs per 100 kg.; Tin, 260 @ 261.50; Lead, 24.25, and Spelter, 41.50.

GERMANY.

(Borrenshalle.)
HAMBURG, Nov. 28, 1882.—**Iron.**—The Sarre, Moselle and Rhine-Westphalian Ironmasters have resolved to maintain iron for beams at 145 marks per ton, deliverable at Neunkirchen, and 142 marks per ton for other materials. They are very quiet. The Siegen people have also come to an agreement to adhere to a uniform rate for Spiegel and White Pig. Since then Foundry Pig has remained steady, while Bessemer metal is weaker. All rolling-mill products are still rather depressed. Hardly any fresh orders are received, so that makers are limited to filling old ones. Consumers have therefore lowered their offers, not exceeding for the present 13 marks per ton for Rod Iron. In the heavy Steel branch the situation remains a highly satisfactory one, liberal orders having been received lately for Steel Rails, Slopers, Hoops, &c. Great animation is noticeable at the Steel and Car-wheel works. This relates equally as much to car shops, but not to locomotive ones; for the Elberfeld Railroad directors an order for 18 locomotives has, however, dropped out of the hands of the makers. They are still in a poor plight as regards work. On the other hand, the steam-boiler people are doing well; furthermore, machinists and foundries. Coal remains active and firm in Rhine-Westphalia. Metals—Lead has continued to slightly look up; we quote English Pig 16 @ 16.50, and German 14.50 @ 15. Copper is steady at 77 @ 79. Tin at 110 @ 113, and Spelter is neglected at 17 marks per 50 kg.

HOLLAND.

(Koch & Vlierboom.)
ROTTERDAM, Nov. 24, 1882.—**Tin.**—After a few days' quiet, Tin has become stronger once more, and has risen from 79 1/2 to 80 1/2. Bilton. Now holders ask for floats 65.50. As for Banca, not much has been done, there being few sellers at current rates; indeed, we do not think that at this closing any could be got under 61.

RUSSIA.

(Golos.)
CHARKOW, Nov. 23, 1882.—**Iron.**—The Government has declared that it approves in principle the petition of Russian makers to levy a duty of 15 copeks per pud of 37 lb. English, and that probably this request will be granted, as well as the one to fix the duty on foreign Coal at 2½ copeks per pud if intended for Moscow, at 3½ if for the Black Sea ports, at 3 if for Poland, and at 1 copek if for the Baltic ports.

AUSTRIA.

(Austrian Trade Journal.)
VIENNA, Nov. 27, 1882.—**Iron.**—The general impression seems to be that the current price of Pig Iron will be sustained in Austro-Hungary till spring next. The demand for Merchant Iron has been rather picking up, stocks in the hands of consumers being low, and many of them wishing to secure some now for fear that later on a sudden rise might be sprung on them. Sheet Iron continues in request at previous rates. The Hungarian Government has been in prices since our last report except in a few specialties more liable to fluctuate than the rest. The Government railroad, instead of intending to sell its Hungarian iron works, as a Parisian rumor wanted it, has, on the contrary, bought the Mahadia coal mines, and will increase the capacity of its Hungarian railway shops preparatory to extending its lines in that portion of the monarchy. The Hungarian Government has, meanwhile, made a contract with Seillere and other French bankers for working the gold and silver mines of Hungary, belonging to the crown, on joint account. Dividends of Austrian Iron and Steel works for 1882, it is estimated, will be better than last year pretty generally. An electric exhibition will be held in this city in August, September and October next, in the rotunda of the World's Fair of 1876. The Government railroad has ordered at Linden, near Hanover, 14 large high-speed locomotives and a compound "Webb" locomotive of Sharp, Stewart & Co.'s Manchester, who are still building for the same line seven high-speed ones, 30 freight cars and 21 passenger cars. Metals have been moderately active and unchanged.

EAST INDIES.

(Dummler & Co.)
BATAVIA, Oct. 2, 1882.—**Tin.**—The next sale of about 12,000 piculs Biliton Tin is to be held on the 21st inst., to be followed by other similar ones on Dec. 27, Feb. 27, 1883, and April 24, 1883. Iron.—No business has been transacted in Swedish Bars, there being no demand, nor is there anything doing in English Iron, while English Copper sheeting sold at 66 guilders for assorted sizes. The fact is that the metal branch continues in utter depression. Coal has been dealt in at secret prices, with large arrivals to consumers. Exchange, 11.95 @ 11.97½.

(Hessener & Co.)
COLOMBO, Oct. 31, 1882.—**Ptombago.**—A moderate business is reported at ensuing quotations, in rupees, per ton: Fine Lump, 150 @ 160; Ordinary, 120

@ 145; Chips, 65 @ 72.50, and Dust, 45 @ 52.50. During the month 10,821 cwts. have been shipped to England and 103 to India; total, 10,924, against last year 25,877, 10,968 in 1880, and 476 in 1879. Exchange, 1/8 7-16.

(Giffilan, Wood & Co.)
SINGAPORE, Oct. 30, 1882.—**Tin.**—The market opened at \$19.50 1/2, and closed at \$20.12 1/2, no buyers. Shipments to London have been large, and that market has declined, ours following, but more slowly. Supplies are reaching Singapore and Penang freely just now, and we think dealers' efforts to manipulate the market will not be successful. **Tonnage.**—The supply exceeds the demand. For New York the E. Nicholson and Andrew Jackson have sailed, and the berth is now occupied by the Erie J. Ray, which has engaged a small quantity of cargo. For Boston the Alice Reed has cleared, leaving the berth vacant. Exchange is weak, and closes at 3/9 1/2. The Anchises took for New York 2438 piculs, and the Lord of Isles 420.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From Our Regular Correspondent.)

LONDON, ENG., Nov. 27, 1882.

THE AMERICAN NEWS

of the past week has astonished a large section of the British public very considerably. It is certain that nobody regarded our market as being in anything like a booming condition, but it is quite safe to allege that four out of every five men of business believed you were doing a steady average turnover. A few exceptionally knowing individuals predicted trouble some weeks ago, when it was reported that the Democrats were making such gains at the State elections, but even these cute persons did not appear to have any foreboding of what has since happened. None but the most sanguine free-trader believed that the Democrats would venture to change the fiscal policy under which you are claimed to make such headway, and neither these nor those who regard the American market as being lost to our manufacturers had any clear conception of the course the Republicans were likely to adopt under their defeat. When, therefore, the daily newspapers last week published cablegrams from New York announcing the proximate collapse of your iron and steel trades, the general feeling here was one of incredulous amazement. It appeared singular that such a changed state of things should have come about so suddenly. At first, indeed, the tidings were discredited, but as day after day the telegrams from your side became more detailed, the feeling of incredulity gave way to one of inquiry into facts and causes. I do not need to quote the dispatches received here—although we do occasionally learn home news away from home—seeing that they are palpably based upon information widely published on your side. The details forwarded, however, refer very largely to your Bessemer and rail concerns, which seems a little singular, seeing that the duty on steel rails is the most vulnerable point of your present tariff, and they are apparently selected by the reformers for early attack. We are told, however, that you are suffering from excessive imports, an adverse trade balance, over-production, a partial suspension of new railroad building, low prices and the weakness of the British iron trade. Admitting the justice of all these contentions, it still seems strange that the break should have taken place so suddenly. What effect the change may have on our market has yet to be seen. So far, its influence has not been great, being confined, in fact, to the descriptions of pig iron lately exported to the States, and to certain industries to be mentioned hereinafter. I am compelled to state, however, that people here do not believe that matters are so bad as they are represented to be by your iron and steel men. There seems to be an impression that the scare is of a theatrical nature, got up for the purpose of intimidating the "tariff for revenue" men, and to throw discredit upon the Democrats. So long as this impression endures, our markets will not be so badly affected as they might be otherwise, but if the next mails should confirm the telegrams, with fuller statements of cause and effect, we may expect to witness a more marked retrograde movement on this side. As was to have been expected, many of the trade papers here comment upon the American news. My space will not allow of other than limited quotations from these articles, but those I give may be taken as being fairly representative of the whole.

The Ironmonger says: "The success of the Democratic party at the recent State elections would appear to have administered a wholesome shock to the extreme protectionists, inasmuch as it is deemed possible that that party may favor a movement in the direction of lower duties on imports. It is by no means certain that the Democrats will take active steps to that end, but, in order to force their hands and bring matters to a crisis, the large iron and steel manufacturers are purposely 'shortening sail' by reducing their hands, and affecting an alarm with which they hope the general public will sympathize. By throwing large numbers of men out of work they seek to enlist the support of the workingmen voters, and thus to checkmate the possible efforts of those who are inclined to favor a 'tariff for revenue' only. Their fears may possibly have a certain amount of foundation in view of financial facts, yet, all things borne in mind, we think it would be premature for our manufacturers to conclude that the American tariff will be materially lowered in the near future. The immediate effect of lower quotations in the States, and the general feeling of insecurity there, will naturally be to diminish importations, especially of pig iron and other materials upon which little labor has been bestowed. Telegrams from New York report that a concern in the United States has accepted an order from Mr. Vanderbilt for 20,000 tons of steel rails at \$40 per ton at the works, equal to \$42 delivered at New York. This concern (the Lackawanna Iron and Coal Company) is reported to allege that the cost of production is over \$40, but they 'hope to lower it by reducing wages and cheapening the material.' On the other

hand, it is held that even \$30 leaves a profit of \$8 1/2 ton. The latter estimate is, we believe, very near the mark, and shows the enormous profits which have accrued to the American Bessemer concerns under the aegis of their protective tariff of \$28 1/2 ton on steel rails. We happen to know, at all events, that a few years ago steel rails were being made at certain works in the United States at a prime cost of \$27 1/2 ton, and we scarcely suppose that that cost has been greatly exceeded of late. At the present time such rails can be sold in this country at \$5, or, say \$20, which price leaves a moderate profit, so that, were the American duties abolished, our makers could deliver their rails in New York at under \$25 1/2 ton, and thus save the American people from the permanent taxes imposed upon them by the exorbitant premiums now paid into the pockets of a limited number of manufacturers.

The Engineer writes: "It is difficult to overrate the importance of the impending crisis in the United States. If we examine the conditions under which these events take place, it will be seen that the mere fall in prices is not sufficient to account for them. It is a serious thing—not to be lightly done—to close a great steel works. The loss incurred when an enormous plant is idle is very heavy, and so long as any money is to be had to go on with, or a hope can be entertained of better times coming, manufacturers will prefer to keep making rails, &c., for stock rather than close their works altogether. On this point, as on most others, the American ironmasters have nothing to learn, and it may be taken for granted that causes are influencing their policy other than a drop in values. In New York it is held that the main causes of depression are over-production and heavy importations, but there is more than this. The truth is that there will soon be no market at all for rails at any price in the United States, and some months at least must elapse before they will again be wanted. With the falling off in the demand for rails, the steel trade of America must go. In this country, if rails are not wanted, ship and boiler plates may be in demand. But America does not build iron ships, and the prosperity of her iron-making districts hangs exclusively on the demand for rails. The trade in bridges even depends for its existence to a great extent on the construction of railways, and there is no reason to doubt that in closing their steel works, the ironmasters of Chicago are adopting the only course open to them. * * * For a long time past the American railway share market has been carefully manipulated. Syndicates have been formed, and new lines suggested, and put before the public by every advertising resource known. The syndicate then go to the world and borrow money on first mortgage bonds, the mortgage being given on property which has practically no existence. Some of the funds thus obtained may be used in commencing the lines mortgaged, and then shares may be sold and more money got; but in some cases no attempt whatever has been made to make the railway. * * * It would appear, however, that the end has nearly been reached, and the result is an entire cessation in the demand for rails, followed by the closing of iron and steel works, and, in all probability, a great deal of that domestic trouble which invariably follows rash speculation on a great scale. The free-trade party in the United States see, in the threatened destruction of a great industry, an excellent opportunity for advocating their principles. They assert that protection means high wages, and that high wages mean high prices—that, in a word, the construction of railways has ceased because rails cost too much. It does not appear, however, that free-trade or protection have anything at all to do with the matter. * * * It is not so long since rails could be bought in the States for about their present price; but works were kept open all the same, because there was a legitimate demand. The rail mills of the United States are being shut now, not because rails are too dear, but because no one will buy them at any price. There is no reason to suppose that this will much, if at all, affect the iron trade in this country. The stock of rails in the United States is very large, and the export of rails from Great Britain to North America has long ceased to possess any importance whatever. The closing of the Joliet and half a dozen other steel works in the States will not sell a single extra ton of rails in this country. Nor will the cessation of American railway construction affect us. We can regard the progress of events with equanimity. It is just possible that the people of the United States may be taught a very important lesson. 'Booms' may be very good things, whether in railways, in pork or wheat, or even in wooden nutmegs, but it is doubtful if, in the long run, 'booms' pay. It is very hard to leave off 'booming' just at the right time."

Iron says: "Various reasons may be assigned for the decrease in the demand for American iron and steel products, and for the consequent decline in the prices obtained for them. First of all, the poor harvest of last year enforced economy upon American farmers in the purchase of many articles, including wagons and agricultural implements, which are largely composed of iron and steel. The next cause may be sought in the adoption of a cautious policy in the building of new railways, and of the wiser course of improving the efficiency and increasing the equipment of the old ones. Finally, the turning of the balance of trade has been against the Americans, through heavy imports of foreign products. According to the Americans, they 'are buying too much abroad'; they 'have bought, and are still buying, too much iron and steel.' It is not very probable that the latter view will gain very many adherents in this country, although the two first causes assigned for the depression are, no doubt, the correct and principal ones. At any rate, we are unable to share the apprehension of a general industrial collapse in the United States. Nor are we inclined to adopt a view which has been circulated there as to the probable cause of the prevailing depression. It has been openly stated that the depression of the American iron trade has been 'got up'—that, in fact, it resembles a strike of the ironmasters, and has been set in scene to prevent any revision of the tariff in favor of the

consumer. There are at present no proofs to hand to confirm such an explanation of the situation; but it will not be denied that the dullness which has so suddenly set in has made its appearance very opportunely for the manufacturers, and that it will supply them with very powerful arguments in support of a protectionist policy."

THE IRON MARKET

is very quiet all round, especially as regards crude descriptions, the values of which have become decidedly weaker since I last exercised the art of paper staining on your behalf. Prior to the receipt of the unfavorable American news the tone had been dull, but your telegrams emphasized the quietude and warned all and sundry that for the present the Caucasian—otherwise the American—market was played out. At Glasgow warrants were quite inanimate from the beginning of the week, and fell, with but occasional and feeble rallies, to 48/6 on Thursday, November 23, outside influences being assisted by the failure of two firms, one of which held about 40,000 tons of warrants on a "bull" account. Similarly, makers' brands have slightly declined, although shipments have been on a fair scale and the stock in Connal's stores continues to grow less. For some reason not yet explained, the four furnaces (all new style) at Calder Iron Works now at work are to be stopped at the end of December, in which case the number of furnaces at work and the make will not be more

most all branches underselling is the rule rather than the exception. It is perfectly certain, for instance, that the marked-bar houses of South Staffordshire are disposing of exceedingly little iron at 28 1/2 ton, and perhaps no great quantity at 27 10/10. I should take 27 as an average for best unmarked iron, and I only repeat what is a well-known fact, when I say that plenty of useful bars are obtainable at 26 5/10 @ 26 10/10, with common Welsh on sale at as low as 25 12/6 @ 25 15/10 ton, f.o.b. The sheet iron rollers, however, are well employed and are almost invariably adhering to their open quotations, which are as per your cablegram of date. Hoops are dull, but chain and cable irons are selling with some freedom, and the tube firms are using moderate quantities of strips. Anvils are going in respectable lots to your market, as also are wire rods and large-sized fencing wire for subsequent diminution in gauge in your mills. The galvanizers are well engaged, as a rule, but the underselling previously noted is still in active existence.

There is no life in iron rails, and the slight demand that had sprung up for old rails from your side has been killed. Old D. H. may be called 75/10 ton, f.o.b., and flanges or bridge sections, 70/10 @ 75/10 ton, f.o.b. good shipping ports. Heavy wrought scrap is very dull at 60/10 @ 62/6, f.o.b., for No. 1 assortments. Old railway leaf spring steel is quoted as before by Messrs. Austin, of

market again relapsed from 49/4 to 49/1, and in the afternoon the failure of two firms caused a further smart fall to 48 6/10 1/2 ton. To day a reaction set in, and the market improved to 49/1, closing with sellers at that figure, buyers near. The shipments last week were 11,316 tons, as compared with 11,153 tons for the corresponding week of last year. We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow.....	50/6	49/1
Clyde, ".....	50/6	49/1
Coltness, ".....	50/6	49/1
Langloan, ".....	50/6	49/1
Gartsherrie, ".....	50/6	49/1
Summerlee, ".....	50/6	49/1
Calder, ".....	50/6	49/1
Carbarn, ".....	50/6	49/1
Glenarnock, at Ardrossan.....	50/6	49/1
Eglinton, ".....	50/6	49/1
Dalmellington, ".....	50/6	49/1
Shotts, at Leith.....	50/6	49/1
Kinnell, at Bo'ness.....	50/6	49/1
Carron, at Grangemouth.....	50/6	49/1

MIDDLESBORO' PIG IRON

is quiet and easy, for reasons already enumerated in this communication. Nothing has been heard of the intentions of the smelters as to prolonging the restricted make into 1883, but it is assumed that that course will be taken, unless, in the meantime, a marked improvement should come about. The statistical position at the end of the year will undoubtedly tell in favor of makers, but it may be set off by adverse circumstances. In No. 3 transactions have taken place at all sorts of prices between



A Twelve-Ton Railway Wrecking Derrick, built by Messrs. James Beggs & Co., New York.

than fractionally in excess of the year before, same date. At Middlesboro' prices have remained weak and nominal under the influence of Glasgow, much smaller general shipments, a renewed tendency to strong bearing, and indifferent financial, political and industrial reports from different parts of the Continent of Europe. The Northern plate makers have had another meeting as to their proposed restriction of the make, but do not appear to have been able to agree in the face of the indifference displayed by the Consett people, who are by far the largest producers in the trade and have many months' work ahead. That being the case, it would not be surprising to learn that the project has been postponed sine die, or altogether abandoned as an impracticable scheme.

On the West Coast the smelters are rendered somewhat uneasy by your collapse, inasmuch as, if fully correct, the news means a total cessation of your demand for pig, blooms and rails, which demand has been found very useful in the past. Mixed parcels are almost nominal at the moment, being offered at from 54/6 to 56/10, with makers' brands as per quotations below. The rail deliveries are good and shipments are fair, but there are reports that American contracts are being canceled by wire, as a consequence of the break on your side. Throughout the Midlands, Shropshire, &c., pig iron is weak and both parties are delaying negotiations in order to see which way the wind blows from your shores. Meantime most brands are purchasable at rates 1/6 @ 2/6 under recent figures. The larger works remain tolerably busy on heavy manufactured iron, and are in no case likely to run short of work during the now short remainder of the year 1882. Some few of them will also start the new year well, but there are others who are by no means happy about the period beyond the Christmas holidays. In merchant iron some of the current reports speak of a "remarkable steadiness" in prices, and cheerfully note quite a notable turnover. I should be only too pleased to be in a position to confirm these views, but my own experience tells me a less flattering tale. If I am correct, and I leave events to be my judge and jury, there are few price lists which are being faithfully adhered to—indeed, in al-

London, and crop ends are 60/ or so, f.o.b. Wales, &c. In Bessemer blooms there is nothing doing, although I fancy large lines could be done at 24 10/ @ 24 12/6 1/2 ton, f.o.b. West Coast. Steel rails are nominal at 25 @ 25 5/10 ton, Cumberland ports, and 25 7/6 @ 25 17/6, Wales, where makers are at present well employed for India, &c. The market for rails is extremely quiet, and it is expected that prices will fall unless new specifications are attracted by the already low rates.

SCOTCH PIG IRON

has been very flat. The brokers have had a further meeting to discuss the question of commission, and have decided to adhere to the old (and present) rate of 1/4 % as between broker and client, but with permission for any broker to divide his commission with brokers only in other cities or towns, as a consideration for the introduction of business. Two failures occurred on Thursday, November 23, thereby throwing 45,000 tons or so into the market, in which outside speculators seem to have lost all interest. There are now 114 furnaces blowing in Scotland (including 11 on hematites), as against 105 a year ago. In Connal's stores there are 615,935 tons (a decrease last week of 1373 tons), against 617,477 tons this date 1881, and 627,186 tons at Christmas, 1881. Shipments last week were 163 tons ahead of the same week last year, and are 49,855 tons in advance to date this year, while importations from Middlesboro' into Scotland are 61,575 tons behind. Last week only 630 tons of Middlesboro' pig went to Scotland, against 6930 tons same week of 1881. Writing from Glasgow, November 24, James Watson & Co. said: "The Scotch iron market has been very depressed this week, a large business being done in warrants at lower prices. The demand for makers' iron continues dull. This, combined with unfavorable reports from America, have induced holders to sell freely. Special brands maintain their value. The Middlesboro' market is a shade easier, while the shipments from the Tees show a marked decrease this month. On Monday last the warrant market opened at 49/9, and rapidly fell away to 49/3, closing at 49/6 1/2 1/2 ton. On Tuesday the market was again flat, with a good business from 49/7 to 48/10 1/2, cash. On Wednesday the price rallied from 48/11 to 49/3 1/2 ton. Yesterday forenoon the

43/6 and 44/3, with G.M.B., f.o.b. at makers' wharves in the Tees, on usual terms, as under:

No. 1 Foundry.....	48/	Mottled.....	42/6
2 ".....	46/	White.....	42/
3 ".....	44/	Refined Metal.....	60/
4 Forge.....	43/6	Kentledge.....	41/6
	43/	Cinder.....	41/

New steel works are being erected at Fighting Cocks, near Darlington. The North Eastern Steel Works (basic) will not be started until after Christmas.

IN HEMATITE PIG IRON

scarcely any new business is reported; consequently prices are on a purely nominal basis. In fulfillment of old contracts, good shipments and rail deliveries are being made. A furnace has been stopped during the week, making 64 (of 82) now at work in the district. Mixed parcels of Nos. 1, 2 and 3, in usual proportions, are 54/6 @ 56/10, and makers' iron as below:

	No. 1.	No. 2.	No. 3.
Hematite.....	50/	50/6	50/
Lomdale.....	50/	50/6	50/
Workington.....	50/	50/6	50/
West Cumberland.....	50/	50/6	50/
Lowther.....	50/	50/6	50/
Moss Bay.....	50/	50/6	50/
Distington.....	50/	50/6	50/
Harrington.....	50/	50/6	50/
Bolway.....	50/	50/6	50/
Maryport.....	50/	50/6	50/

Buyers of large lots might readily shade these rates. Last week's shipments included 14,783 tons of hematite pigs and 4530 tons steel rails, &c.

PROPOSED STANDARD WIRE GAUGE.

For a very long time past the want of a standard wire gauge has been increasingly felt in this country, and inconvenience, as well as actual loss, have been experienced in consequence of the divergent gauges in use. In order to remedy this state of affairs, a persistent agitation, headed by your contemporary, the *Ironmonger*, has been conducted, and the Board of Trade have at last moved officially in the matter, as will be seen by the appended circular, &c.:

"I am directed by the Board of Trade now to acquaint you that they have received much valuable information, in reply to their circular communication of April 15 last, with reference to a standard wire gauge, and that the scale of sizes therein suggested appears, on the whole, to meet the require-

ments of trade. In consequence, however, of representations made as to the larger sizes, this board have felt it desirable to modify the original scale, and I am therefore to forward to you a copy of the new scale, and to ask your opinion thereon. Should the enclosed scale be generally approved, the board would be prepared to advise Her Majesty in Council to authorize its use. It is to be hoped that, after such authorization, the provisions of the Weights and Measures act, with regard to the use in trade of measures for which Board of Trade standards have been made, will assure for the standard wire gauge a fair prospect of success."

NEW DENOMINATIONS OF STANDARDS.

Descriptive No. (B. W. G.)	Original Scale, April, '82.	Modified Scale to be Legalized as the Standard, Nov., 1882.		Equivalents in millimeters.
		In decimal parts.	In Aliquot parts.	
8/0	.500	.535	1/2	13.50
7/0	.470	.500	3/4	12.70
6/0	.440	.450	1/2	11.91
5/0	.415	.438	3/8	11.13
4/0	.390	.406	1/2	10.31
3/0	.365	.375	5/8	9.54
2/0	.340	.344	3/4	8.74
1/0	.320	.325	7/8	8.26
1	.300	.300	1	7.62
2	.280	.275	3/4	7.00
3	.260	.250	5/8	6.35
4	.240	.230	3/4	5.84
5	.220	.210	5/8	5.33
6	.200	.190	3/4	4.83
7	.180	.170	5/8	4.32
8	.160	.155	3/4	3.94
9	.145	.140	5/8	3.56
10	.132	.125	3/4	3.18
11	.120	.110	5/8	2.79
12	.108	.100	3/4	2.54
13	.095	.090	5/8	2.33
14	.084	.080	3/4	2.13
15	.072	.070	5/8	1.78
16	.064	.062	3/4	1.58
17	.056	.055	5/8	1.40
18	.048	.048	3/4	1.22
19	.040	.040	5/8	1.02
20	.036	.036	3/4	.91
21	.032	.032	5/8	.81
22	.028	.028	3/4	.71
23	.024	.024	5/8	.63
24	.022	.022	3/4	.56
25	.020	.020	5/8	.51
26	.018	.018	3/4	.46
27	.016	.016	5/8	.41
28	.014	.014	3/4	.36
29	.013	.013	5/8	.33
30	.012	.012	3/4	.31
31	.011	.011	5/8	.28
32	.010	.010	3/4	.25
33	.0090	.0090	5/8	.23
34	.0080	.0080	3/4	.20
35	.0070	.0070	5/8	.18
36	.0065	.0065	3/4	.16
37	.0060	.0060	5/8	.15
38	.0055	.0055	3/4	.14
39	.0050	.0050	5/8	.13
40	.0045	.0045	3/4	.11
41	.0040	.0040	5/8	.10
42	.0035	.0035	3/4	.09
43	.0030	.0030	5/8	.08
44	.0025	.0025	3/4	.06
45	.0020	.0020	5/8	.05
46	.0020	.0020	3/4	.04
47	.00175	.00175	5/8	.04
48	.00150	.00150	3/4	.03
49	.00125	.00125	5/8	.03
50	.00100	.00100	3/4	.03

DEPHOSPHORIZATION

is "going rather slow" in this country, but a start is about to be made in South Staffordshire by the company recently formed there. Mr. Percy Gilchrist, one of the inventors, delivered an address on November 25th to the Association of Mill and Forge Managers, in which he described the process and its results, and was also enabled to show the meeting a number of good specimens sent by Mr. Windsor Richards, of Bolckow Vaughans. At Middlesboro', the North Eastern Steel Co.'s new works for this process are being pushed ahead, and are fitted with the best machinery and plant attainable. Mr. Thomas has patented an improved "rocking" converter, but I am sorry to say his health does not improve; indeed, he has left England for Australia for the winter, as I told you would be the case some time ago. He has all our good wishes for a speedy return and better physical condition.

A New Railway Wrecking Derrick.

In the accompanying cut we present a new railway wrecking derrick manufactured by Messrs. James Beggs & Co., of this city. It is claimed to be the heaviest and most durable of its class ever constructed, and appears to meet with great favor among our leading railways which have them in use. As shown in the cut, the entire apparatus is mounted on a large circular bed-plate, which is some 8 feet in diameter, and weighs about 2 tons. By means of suitable bolts this is fastened to the wrecking-car, and in order to prevent the tipping of the whole apparatus and car combined, when lifting a very heavy weight, the vertical pillar is provided with lugs for the attachment of suitable stays. The boom is made of wrought iron, and is strongly braced and fitted with a compound direct-gear hand-wheel. The drum is grooved for the hoisting chain, and is fitted with a friction strap which is operated by a lever, seen in the engraving. The pillar is strapped with wrought iron, and at the bottom is fitted with anti-friction rollers, by means of which the boom may be readily swung around. The top is provided with an equally ingenious arrangement, and suitable provisions are made to keep the bearings well lubricated. The appliance is rated as a 12-ton derrick, but in case of need this load may be exceeded by some 3 or 4 tons. The boom is supported by a chain and iron rod, and the connection thus effected may be shortened or lengthened, as required, by inserting the hook at one end of the bar into different links of the chain. As a rule, however, the length is maintained constant and will be found effective for all ordinary work. The whole apparatus is very massive and is well adapted for heavy work.

Proposed Industrial Exposition.—At a meeting recently held by the leading manufacturers and business men of Chattanooga, it was resolved to organize immediately a movement for a national industrial, mineral and mechanical exposition, to take place in Chattanooga in 1884. Working committees were appointed, and promise is given that the enterprise will be actively pushed forward.



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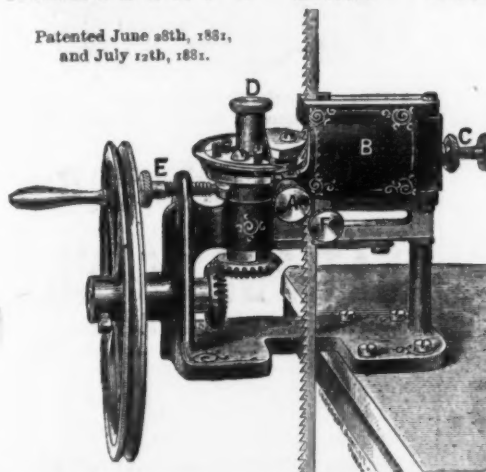
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hour. Keeps the teeth even and level,
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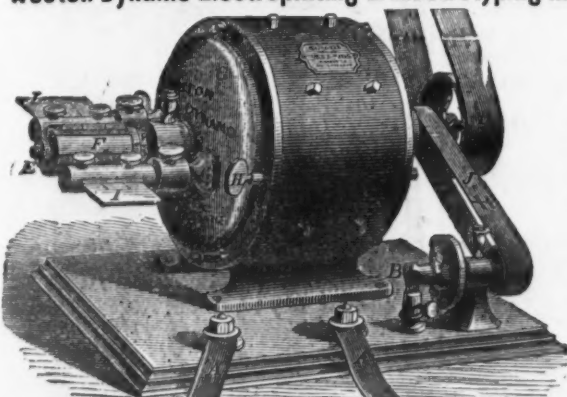
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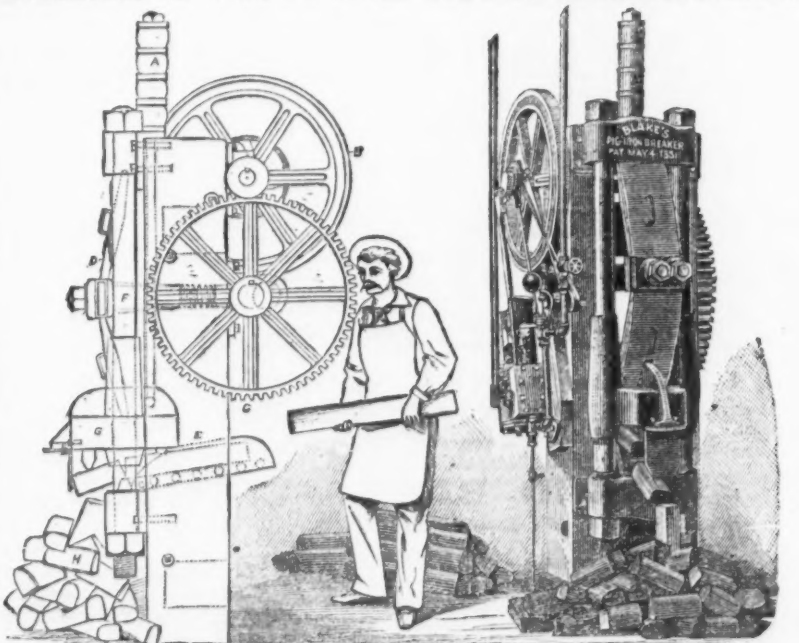
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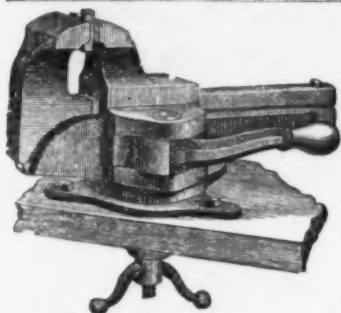
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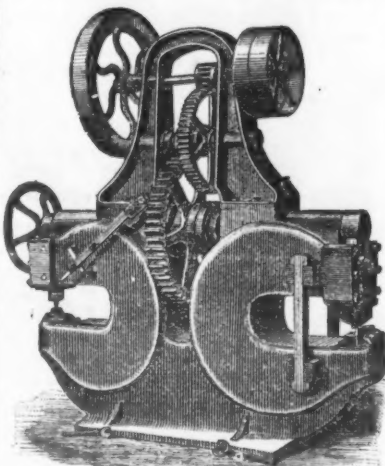
Effect of Wind on Draft of Chimneys.
—In a paper bearing the above title, and which was recently read at Southampton, England, by Lord Rayleigh, it was stated that a horizontal wind would usually promote a draft, except in cases where the chimney opened out upon a large expanse of wall, and so was indirectly affected, in which case there was only one cure—namely, to carry the chimney higher. When the wind was inclined downward to the chimney at an angle of 30° and more, there was a down draft, and the maximum up draft was produced by wind inclined upward at about the same angle. The simplest thing to prevent wind blowing down a chimney was to erect a T-piece on the top. In that case a vertical or inclined wind favored the draft, and the effect of a wind blowing through the T tube was practically nothing. Lord Rayleigh, moreover, contended that chimneys should be turned upside down—that is, the opening at the fireplace should be narrow and the outlet wide—and that if all the chimneys in a house could be made to open into a common cloaca, a down draft would hardly ever occur.

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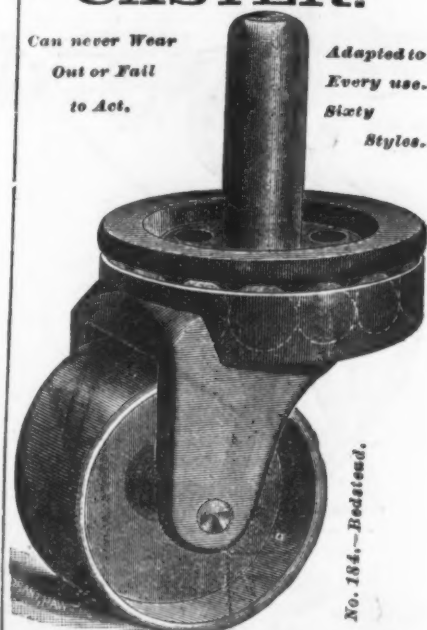
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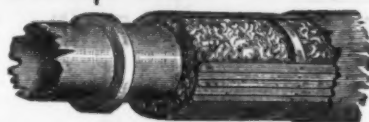
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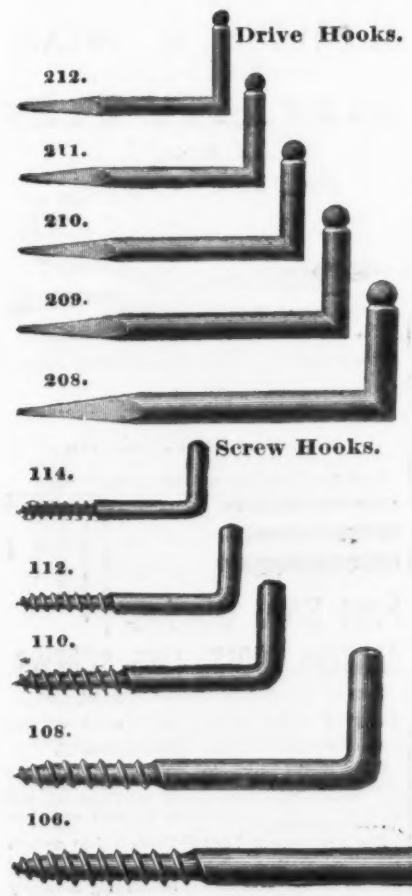
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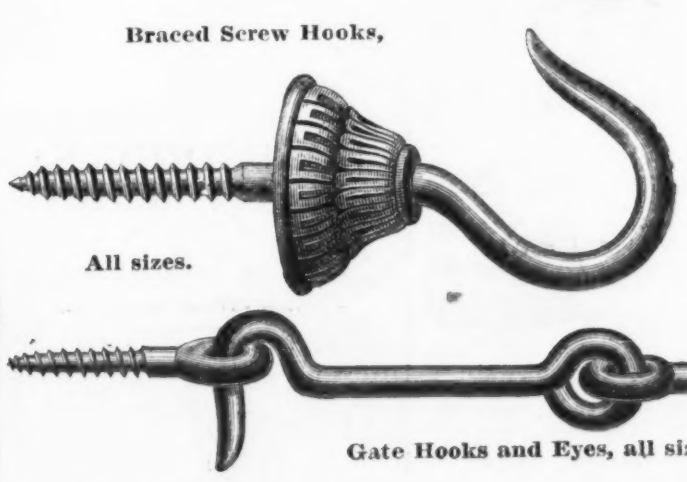
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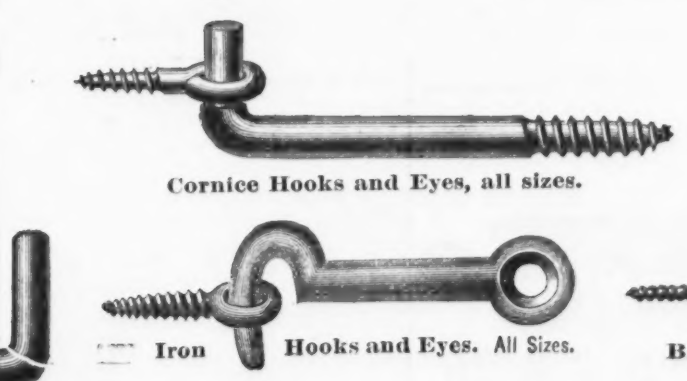
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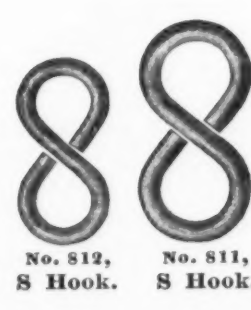
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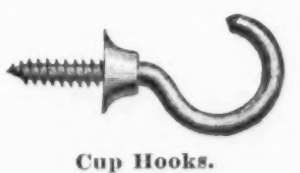
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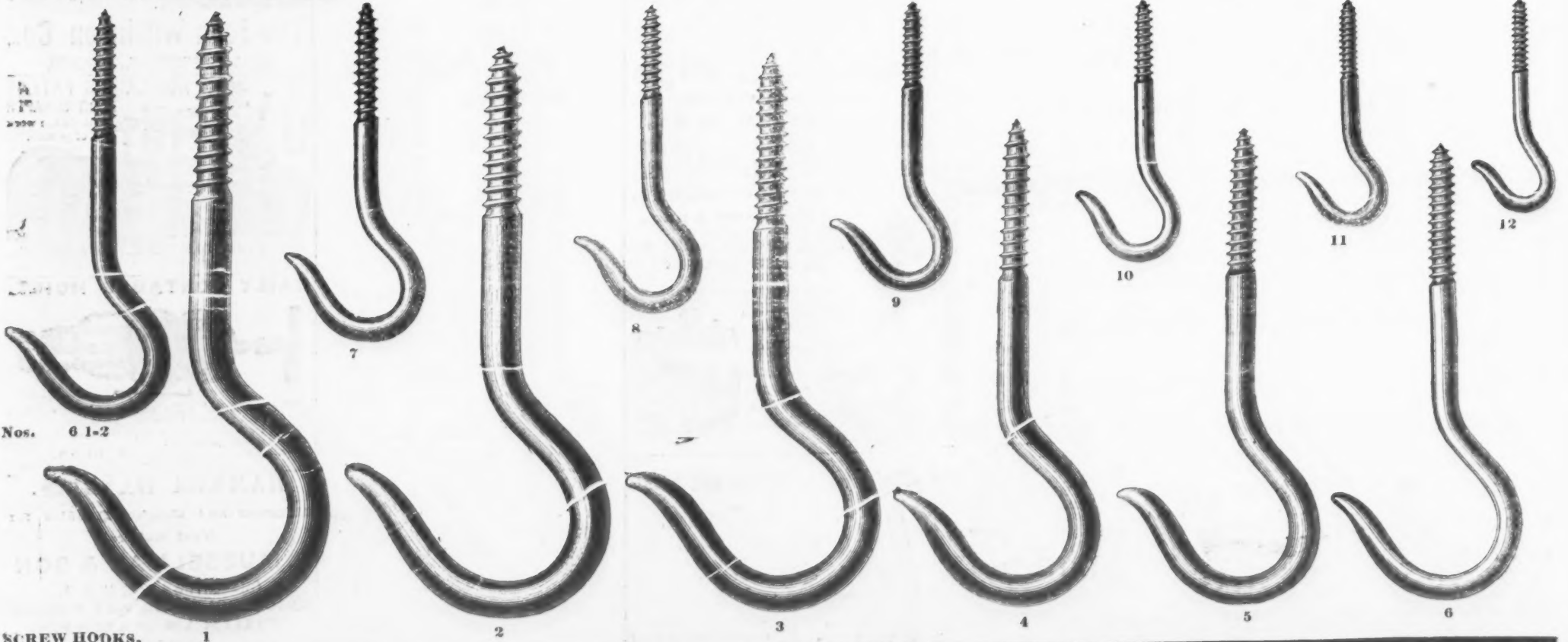
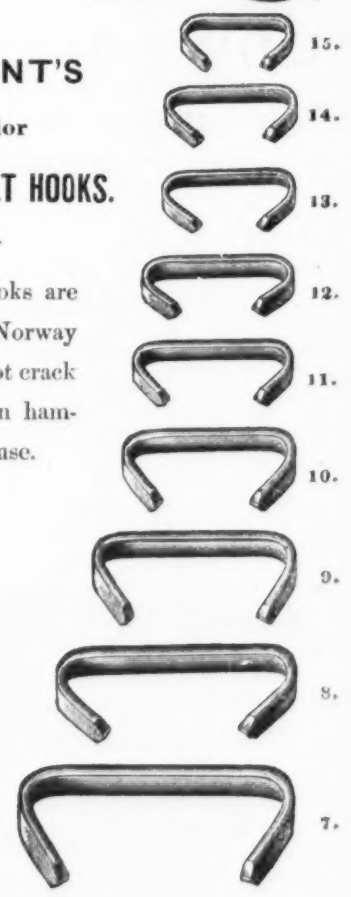
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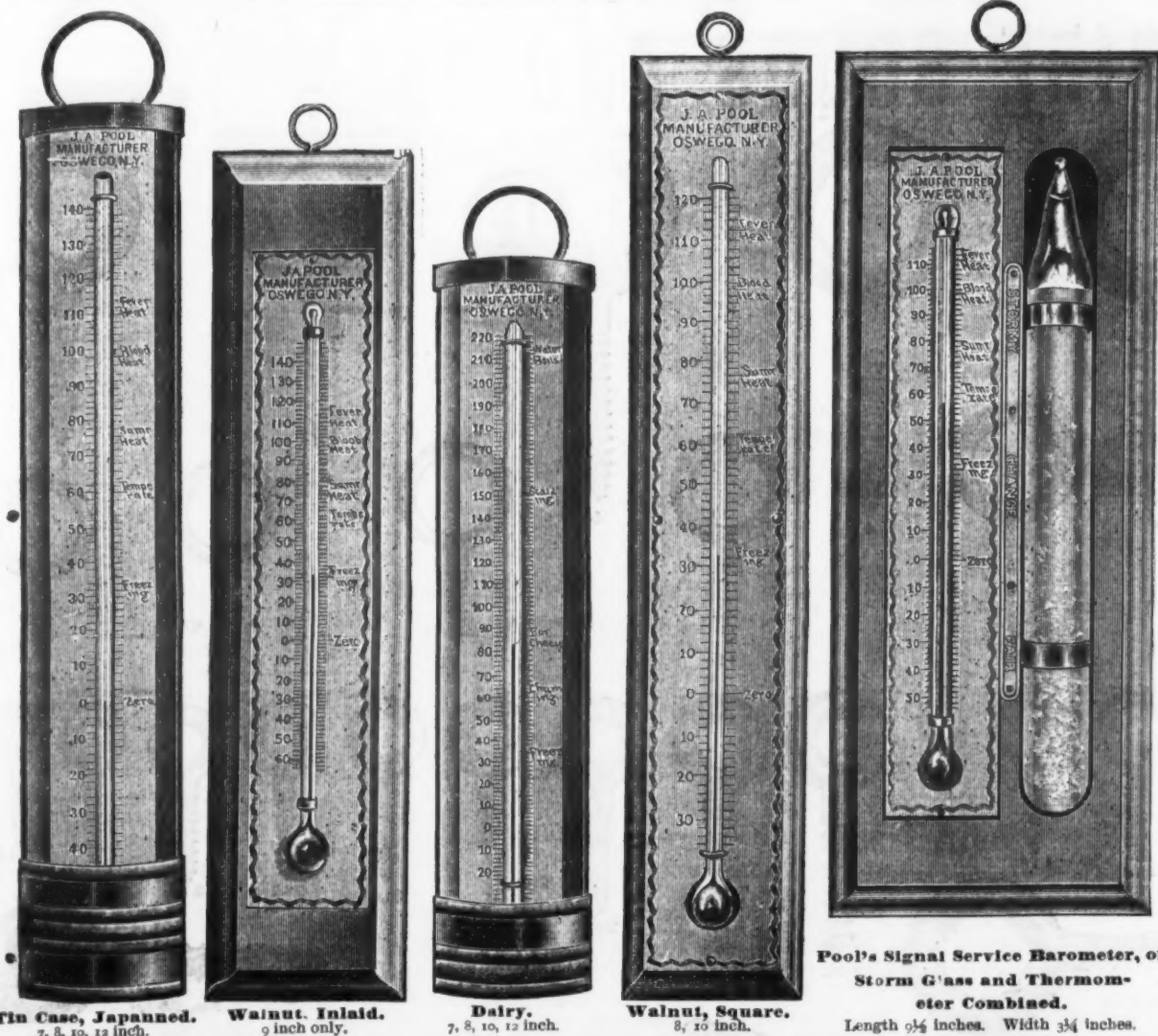
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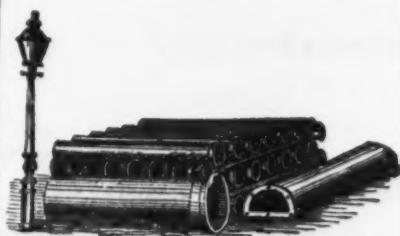
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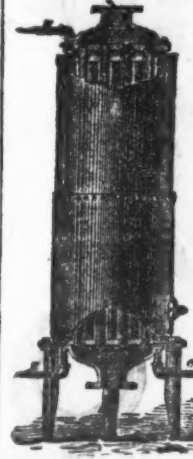
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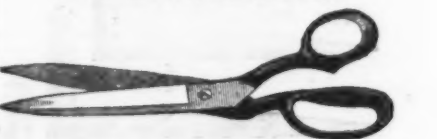
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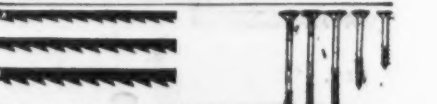


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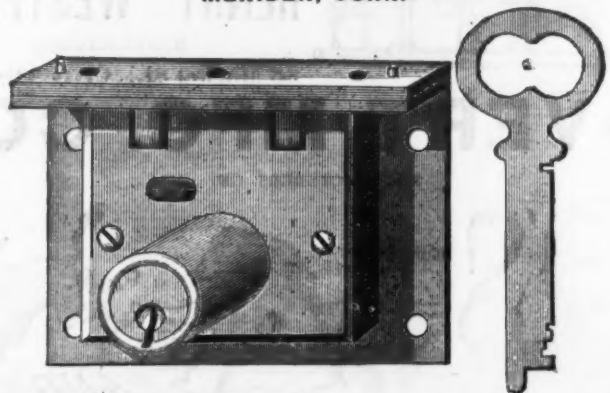
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AND TRIMMINGS.**



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ORNAMENTAL BRONZE FRONT LOCK AND LATCH,
And a general line of
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PETER GERLACH & CO.,

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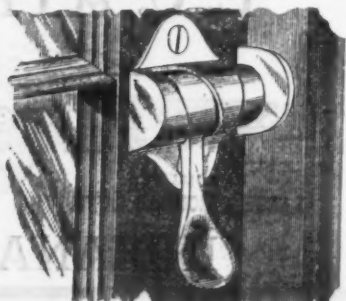
HYDE, AYER & CO.,
PATENT SPECIALTIES,
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Sole N. Y. Agts., Stoddard Lock Co., 104 Reade St., N. Y.



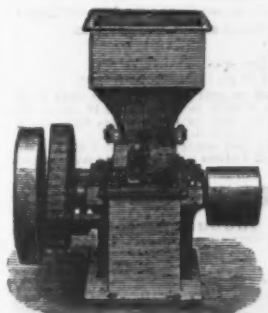
The movement is obtained by
a thumb-screw acting upon a
cross-bar, which slides backward
and forward over the caliper leg.
The movement of the screw is
about one to four of the caliper,
thus the action of the caliper is
both rapid and positive.

Patented Dec. 20th, 1881.

Exceeds all other Calipers, not
being dependent on a spring at
top. Is as strong wide open as
when partially closed.



Holds the window at any point, prevents all rattling
and locks the same when down. Wears the longest
and costs the least of any fastener in the market.



**NEWELL'S
UNIVERSAL MILL.**

Pulverizes everything—hard, soft, sticky, and
gummy. Grain, Drugs, Chemicals, Clay, Gesso,
Cotton Seed, Bark, &c., &c. A wonderful ma-
chine for grinding Corn, Oats, Feed, &c. Also
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BOSS AND CROWN SPRINGS, For light doors.

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**POLISHES
ARE THE STANDARD OF THE WORLD.**

LUSTRO METAL POLISH

HAS BEEN THOROUGHLY TESTED AND UNIVERSALLY APPROVED as a means of quickly and without labor restoring and
preserving unsullied the brightness of Silverware, Jewelry, Nickel Stove Plates, Plated Ware, Show Cases, &c.

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IS COMPOSED OF THE VERY BEST MATERIALS; will black more stoves in a given length of time than any other polish now on th
market. It produces a dark, brilliant polish, is free from dust, and gives satisfaction every time. After a trial you will buy no other

LUSTRO METAL POLISH put up in 4 oz. Bottles, 1 Doz. in Case.

LUSTRO STOVE POLISH packed in Patent Cans, and Attractively Labeled.—1 and 5 lb. cans for Stove
Dealers and Manufacturers; 3 oz Tins in 1/4 gro. Box for Household use.

A TRIAL ORDER SOLICITED.

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Sole Proprietors of the "Lustro Polishes," 171 Duane St., N. Y.

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Richardson's Trade Mark. A Maltese
Cross with the Letters R S T, Em-
blematical of the Standing of the Saws
in the Trade.

Richardson's One or Two Man Cross-Cut Saw,
with Patent Adjustable Handle. The Improved
Handle Can be Used Upright, at Either End of
the Saw as Shown in the Cut, or Inclined in
Either Direction.

RICHARDSON'S SAWS

Have Justly Obtained an Enviably Reputation.

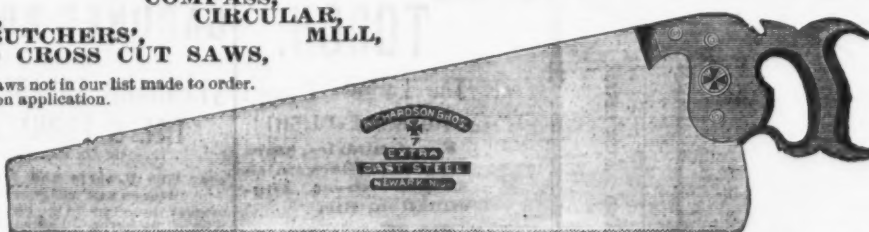
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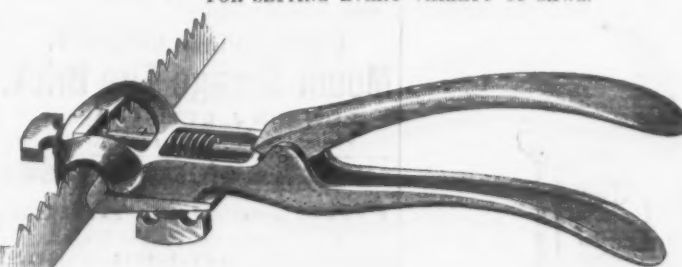
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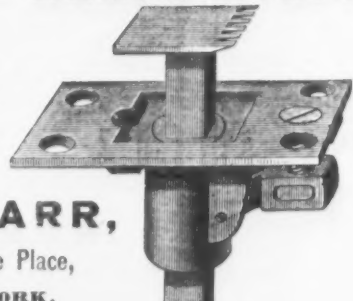
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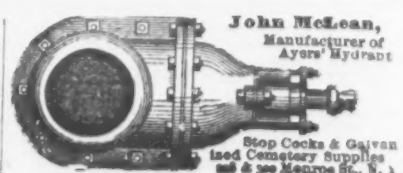


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75 MAIN STREET,
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Manufacturers of 5, 6, 8, and 10 in. Heavy Strap Hinges. Our facilities enable us to quote lower
prices than any other manufactory. Will sell Half Barrel Lots, Assorted. Also manufacturers of
MANN'S PATENT CONNECTING LINK, for Chains. Considered the best in the market
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Full information concerning the plan of the Company's operations can be obtained at the
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Census Bulletin No. 283,
SHOWS
47,683,951 HOGS
In the United States and Territories.

Alabama.....	1,352,460	Missouri.....	4,553,123
Arizona.....	3,510	Montana.....	10,276
Arkansas.....	1,565,028	Nebraska.....	1,241,774
California.....	603,450	Nevada.....	9,080
Colorado.....	7,569	New Hampshire.....	53,437
Connecticut.....	61,569	New Jersey.....	219,269
Dakota.....	63,391	New Mexico.....	7,857
Delaware.....	46,186	New York.....	751,007
Dist. of Columbia.....	1,110	North Carolina.....	1,453,541
Florida.....	297,051	Ohio.....	3,141,391
Georgia.....	1,711,005	Oregon.....	126,222
Idaho.....	14,726	Pennsylvania.....	1,187,668
Illinois.....	4,170,266	Rh. de Island.....	14,121
Indiana.....	3,196,413	South Carolina.....	628,198
Iowa.....	2,034,310	Tennessee.....	2,165,169
Kansas.....	1,787,090	Texas.....	1,954,018
Kentucky.....	2,254,215	Utah.....	72,168
Louisiana.....	613,480	Vermont.....	76,364
Maine.....	74,169	Virginia.....	956,451
Maryland.....	338,668	Washington.....	46,528
Massachusetts.....	67,123	West Virginia.....	910,613
Michigan.....	904,071	Wisconsin.....	1,128,824
Minnesota.....	381,415	Wyoming.....	697
Mississippi.....	1,151,418		

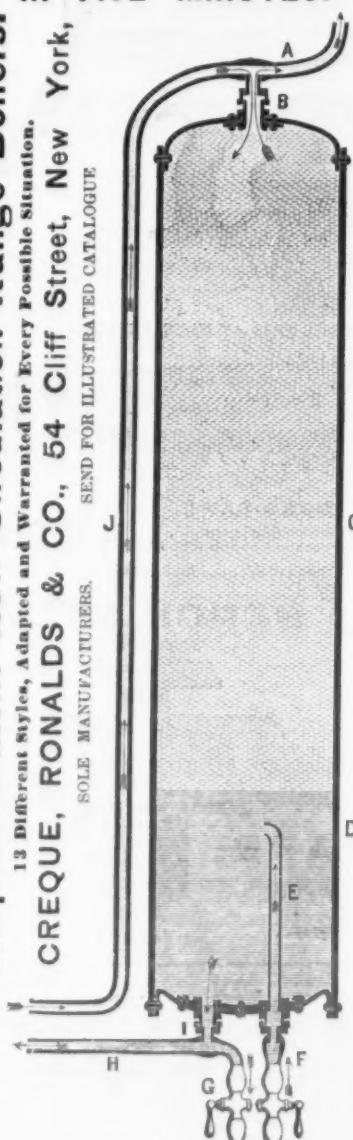
We are selling annually enough of HILL'S TRIANGULAR
RINGS to supply one-third of any possible demand, as
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Shops, Street Illu-
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complished. Simple and
Efficient.

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KEYSTONE PORTABLE FORGE.



Best in the Market. Strong blast and easily worked,
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FIRE BRICK.**

BEST AND CHEAPEST.
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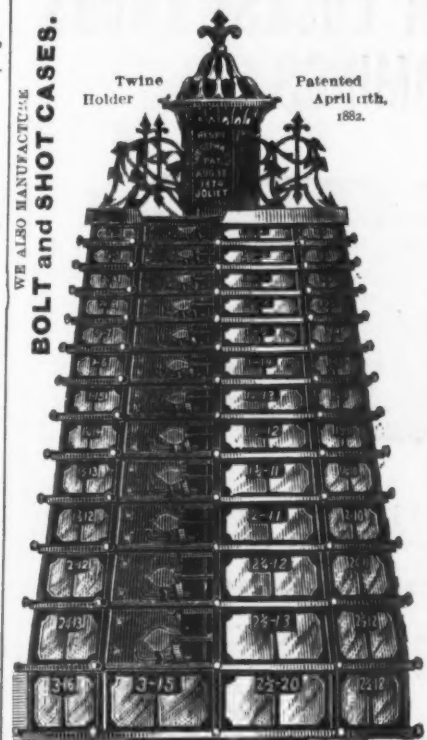
SELF-LOCKING SCREW CASE.

Made from the Best Gray,
Malleable and Sheet Iron.

This is not a Drawer Case. This Structure has been
purposely invented on account of trouble caused by
a Drawer.

The Standard of This Case is a Hollow Cone,
Firm as a Rock, on Which all
Shelves Revolve.

All Shelves can be taken off and replaced in a few
minutes.
The ornamental front frames of each Circle, well
protected, contain a piece of glass, whereby the deal-
er can see through all Compartments in a minute,
and if any number is out, can fill, or if not in stock,
can order, which in a Drawer-Case makes a great
deal of trouble. The front frames can be taken out
and replaced by anyone in no time, thus making it
the most perfect structure ever placed upon the
market. With beauty and strength combined, it
surpasses even perfection in the highest state.
YOU HAVE NO DRAWERS TO TAKE OUT OR PUT BACK.
No mixing of Screws by Customers helping them-
selves, AS IS THE CASE WITH DRAWERS TAKEN FROM THE
COUNTER. No losing of Customers while looking
through Drawers of mixed Screws.
IN OUR CASE ONLY ONE COMPARTMENT IS OPEN AT THE
TIME AND THE BALANCE ALL CLOSED. No one can get
into the Case except the man behind the counter.
Any number can be found instantaneously. By
turning to the right, numbers INCREASE, by turning to
the left, DECREASE. All numbers are cast on the
frames and gold-bronzed. WE GUARANTEE OUR CASE
FOR 4 YEARS, AND IF NOT FOUND SUPERIOR TO ANY CASE
NOW OFFERED TO THE TRADE, AFTER THAT, CAN BE RE-
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MONEY.



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CHAIN AND ROPE GOODS.

These goods are sold by all leading jobbers in General and Saddlery
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LARGE CIRCULAR SAWS.
SOLE MANUFACTURERS
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JENKINS PATENT VALVES.
GATE, GLOBE, ANGLE, CHECK AND SAFETY.

Manufactured of Best Steam Metal.

We claim the following advantages over all other Valves and Gauge Cocks now in use:
1.—A perfectly tight Valve under any and all pressures of steam, oils or gases.
2.—Send or Grift of any kind will not injure the seat.
3.—You do not have to take them off to repair them.
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5.—The elasticity of the Disc allows it to adapt itself to an imperfect surface.
In Valves having ground or metal seats, should sand or grit get upon the seat it is
impossible to make them tight except by regrinding, which is expensive if done by
hand, and if done by machine soon wears out the valve, and in most cases they have
to be disconnected from the pipes, often costing more than a new valve.
The Jenkins Disc used in these Valves is manufactured under our 1860 Patent and
will stand 20 lbs. steam. Sample orders solicited. All Valves sold by us are warranted
and are stamped.

JENKINS BROS.,
71 John Street, New York. 104 Sudbury Street, Boston.



Automatic Damper Regulators and Weighted Gage Cocks.

In extensive and successful use by the best concerns in the country. They have no equals. Liberal dis-
counts to the trade. Send for Circulars and Price List.
MURRILL & KEIZER, 28, 30, 32 Holliday Street, Baltimore.

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Woodland, Clearfield Co., Pa.,

MANUFACTURERS OF

"WOODLAND" BRAND FOR STEEL FURNACES OF ALL KINDS, BLAST FURNACES AND
MALLEABLE IRON WORKS.

"BRADFORD" Brand for Rolling Mills, Glass Houses, &c.

"W. F. B." Brand for Hot Blast Stoves, Stacks, Cupolas, and all work requiring a cheap
grade of brick. Also, Fine Ground Clay to lay brick.
Western Office, 36 Sixth Street, Pittsburgh, Pa.

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and Index to Advertisements.

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Grant Farm Mill and Cradle Co., Melrose, N. Y. 10

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Snigge & Co., Buffalo, N. Y. 10

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Lindeman O. & Co., 24 Pearl, N. Y. 10
Maxheimer John, 24 and 26 Pearl, N. Y. 10

Bits and Drills.

Derby Bit Co., Ansonia, Conn. 10

Bits, Bell Hangers, Telephone and Chair-makers.

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Ansonia Brass Co., 15 Cliff, N. Y. 280
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Brown & Bros., 31 Chambers, N. Y. 10
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Rome Iron Works, 100 John, N. Y. 10
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Bridge Builders.

Mosley Iron Bridge and Roof Co., 1 Day, N. Y. 4
Buckley, P. & Co., 100 Chambers, N. Y. 10
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Clark Mfg. Co., 100 Chambers, N. Y. 10
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Butts and Hinges.

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Carpenter's Tools.

Roberts A. P. & Co., 25 S. 4th, Philadelphia. 10

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Payson Mfg. Co., Chicago, Ill. 10
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S. Cheney & Co., Philadelphia, Pa. 10
Devlin Thos. & Co., Philadelphia, Pa. 10
Haight & Clark, Albany, N. Y. 10
Hammer & Co., 100 Chambers, N. Y. 10
Indiana Foundry Co., Indianapolis, Ind. 10
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Bradlee & Co., 100 Chambers, N. Y. 10

Chemicals.

Emet & Amend, 20 Third Ave., N. Y. 10

Chimneys, Manufacturers of.

Buck Bros., Millbury, Mass. 10

Chucks.

Union Mfg. Co., 40 Chambers, N. Y. 10

Cutlery, Importers of.

Baker Hermann & Co., 101 Duane, N. Y. 348
Cathcart F. & Co., 101 Duane, N. Y. 348
Field Alfred & Co., 43 Chambers, N. Y. 10

Cutlery, Manufacturers of.

Furness, Bannister & Co., Newark, N. J. 10
John Russell Cutlery Co., Turners Falls, Mass. 44

Deoxidized Bronze.

Philadelphia Smelting Co., Ltd., Philadelphia, Pa. 38

Dog Collars.

Medford Fancy Goods Co., 40 Duane, N. Y. 9

Dinner Pail and Lantern.

Haight Joseph, Fort Chester, N. Y. 10

Door and Gate Springs.

Van Wagoner & Williams, 35 Beekman, N. Y. 44

Door Hangers, House and Barn.

Stevens E. C., 100 Chambers, N. Y. 10

Drilling Machines, Makers of.

Peerless Punch and Shear Co., 115 W. Liberty, N. Y. 43
Sellers Wm. & Co., Phila. and 70 Liberty St., N. Y. 43
Stutz Clark, Springfield, O. 10
Thorne, De Haven & Co., Philadelphia. 42
Wiley & Russell Mfg. Co., Greenfield, Mass. 38

Drop Forgings.

Brown R. H. & Co., Westville, Ct. 42

Drop Hammers.

Williams, White & Co., Moline, Ill. 41

Edge Tools, Makers of.

Doocott M. & Co., Philadelphia, N. Y. 10

Elevators, Makers of.

Clem & Morse, Philadelphia, Pa. 43
Crane Bros. Mfg. Co., Chicago, Ill. 43
Easton & Co., Philadelphia, Pa. 43
Stokes & Parrish, Philadelphia. 42

Emery and Emery Wheels.

Hyde, Ayer & Co., Springfield, Mass. 10

Emery Wheel Turning Tools.

Emery Wheel Works, 100 Chambers, N. Y. 10

Engraving and Saw Mills.

Farquhar, A. B., York, Pa. 26

Engines, Gas.

Schlicher, Schlicher & Co., Philadelphia. 10

Engines, Locomotive.

Baldwin Locomotive Works, Philadelphia, Pa. 6

Engines, Steam, Makers of.

Cooke & Co., 12 Courtland, N. Y. 28
Cot & Sons, 100 Chambers, N. Y. 10
Dunbar R. & Son, Buffalo, N. Y. 10
Erwin Chas. W. & Co., Philadelphia, Pa. 43
Franklin, 100 Chambers, N. Y. 10
Rumsey L. H. & Co., St. Louis, Mo. 10
Southway Foundry and Machine Co., Philadelphia. 43
The Norwalk Iron Works Co., S. Norwalk, Conn. 43
Wetherill Robt. & Co., Chester, Pa. 43

Engravers, Wood.

Crosscup & West, Philadelphia, Pa. 32

Facings, Foundry.

Tricycle Mfg. Co., Philadelphia, Pa. 3

Faucets, Makers of.

McNair & Harlin Mfg. Co., 20 Gold, N. Y. 41

Faucets, Solder, Makers of.

Enterprise Mfg. Co., of Pa., Gold, and N. Y. 33

Feed Cutters.

Carr & Johnson, 47 Cliff, New York. 16

Fencing, Ac.

Champion Iron Fence Co., Kenton, Ohio. 26
Cleveland Wrought Iron Fence Wks., Cleveland, O. 17

Filles, Importers of.

Field Alfred & Co., 43 Chambers, N. Y. 10
Carr J. & Riley, 30 Gold, N. Y. 10
Montgomery & Co., 105 Fulton St., N. Y. 32

Filles, Manufacturers of.

Johnson & Sons, 100 Chambers, N. Y. 10
Barnett O. & H., 41 and 43 Richmond, Phila. 8
Boynton E. M. & Co., 100 Chambers, N. Y. 10
Dieton Mfg. Co., 100 Chambers, N. Y. 10
Detroit File Works, Detroit, Mich. 10
Everhart James M., Scranton, Pa. 44
Henderson & Sons, 100 Chambers, N. Y. 10
Johnson & Bros., 100 Chambers, N. Y. 10
McCaffrey & Bro., 100 and 102 4th, Phila. 8
Northwestern File Works, 100 Chambers, N. Y. 10
Paul Chas. R., Williamsburg, N. Y. 8
The J. Barton Smith Co., Philadelphia, Pa. 8
Union File Works, Baltimore, Md. 8

Fires, Makers of.

Borgner & O'Brien, Philadelphia, Pa. 30
Colson Chas. D., Chicago, Ill. 30
Cotton Mfg. Co., Philadelphia, Pa. 30
Hall Terra Co., 100 Chambers, N. Y. 10
Hall & Sons, Buffalo, N. Y. 10
Kreischer R. & Sons, 100 Chambers, N. Y. 10
Miller Samuel F., 100 Chambers, N. Y. 10
Maurer Henry, 100 Chambers, N. Y. 10
Newton & Co., Albany, N. Y. 10
O'Brien & Sons, 100 Chambers, N. Y. 10
Rimington S. A., 40 and 42 Broadway, N. Y. 30
Union Mining, Philadelphia, Pa. 30
Valentine M. D., 100 Chambers, N. Y. 10
Watson Fire Brick Co., Perth Amboy, N. J. 30
Woodland Fire Brick Co., Woodland, Pa. 30

Fire Shovel and Pick.

Wheeling Hinge Co., Wheeling, W. Va. 18

Fishing Reels.

Mallison, Fred, Brooklyn, K. D., N. Y. 10

Flintstones.

Grinnam & Haines, 113 Chambers, New York. 8

Forges, Portable, Ac.

Buffalo Forge Co., Buffalo, N. Y. 44
Hill Mfg. Co., Cleveland, O. 44
Keston Forge Co., 100 Chambers, N. Y. 10

Forgings, Iron and Steel.

Alker & Cromlish, Allegheny, Pa. 10
Hubbard Charles, 100 Chambers, N. Y. 10
Kose Wm. & Sons, West Philadelphia, Pa. 6

Foundry Facings.

Whitehead Bros., 100 Chambers, N. Y. 10

Foundry Supplies.

Emmett J. A. & Co., Philadelphia, Pa. 10
Churnham & Co., Cincinnati, O. 10

Furnaces, Makers of.

Richmond & Potts, 100 Chambers, N. Y. 10
Furnace for Iron and Steel, 100 Chambers, N. Y. 10
Upton A. F., Boston, Mass. 10

Furnace Hoists.

Glenn Mfg. Co., Philadelphia, Pa. 42

Furniture Springs.

Carv & Moen, 234 W. 25th, N. Y. 10

Gauges, Checks.

Murphy & Keller, Baltimore, Md. 10

Grate Bars.

Creswell David S., Philadelphia, Pa. 41
Salamander Grate Bar Co., 110 Liberty, N. Y. 17

Grindstones.

Leont & Co., Boston, Mass. 10
McMurtree & Berea Stone Co., Cleveland, O. 33
Ohio Grindstone Co., Cleveland, O. 33
St. Louis Grindstone Co., St. Louis, Mo. 33

Gripes, Makers of.

Lafin & Hand Powder Co., 25 Murray, N. Y. 40

Handles (Hickory).

McCullough & Brothers, Co., Knoxville, Tenn. 33

Handles and Spokes.

Hendley V. G., 100 Chambers, N. Y. 10

Hangers, Barn Door.

Moore S. H. & E. Y., Chicago, Ill. 45

Hardware Caskets.

Brooks & Leach, 100 Chambers, N. Y. 10
Field Alfred & Co., 43 Chambers, N. Y. 10
Grinnam & Haines, 113 Chambers, N. Y. 8
Rollins John G. & Co., London, Eng. & New York. 17

Hardware Dealers.

Lloyd & Sons, 100 Chambers, N. Y. 10

Hardware (Fancy).

Burner & Seymour Mfg. Co., 100 Chambers, N. Y. 39

Hardware Importers.

Baker Hermann & Co., 101 Duane, N. Y. 348
Field Alfred & Co., 43 Chambers, N. Y. 10
McKay & Sons, 100 Chambers, N. Y. 10

Hardware Job Lots.

Wheeler, A. W., Chicago, Ill. 10

NEW YORK WHOLESALE PRICES, December 13, 1882.

METALS.

IRON.—DUTY. Bars, 1 to 140. # 1; Sheet, Band and Scrap, 14 to 140. # 1; provided that none of the above iron shall pay a less rate of duty than 25 per cent. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

American Iron. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

English Iron. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Rails. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Steel. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Sheet. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Galvanized. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Copper. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Brass. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Lead. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Zinc. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

Antimony. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

German Silver. Pig, 27 # ton; Polished Sheet, 30 # ton; Wrought Scrap, 25 # ton; Cast Scrap, 25 # ton. Railroad, 25 # ton. Boiler and Plate, 150 # ton.

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All Mandrel Drawn Tubes under 3/4 in. 25 cents per pound advance.

Plain. Zinc Tubing—dia. 2 1/2. 37

Fancy. 38

Scotch and Extra Patterns. 39

German Silver Tubing—dia. 2 1/2. 40

1 Per cent. 41

6 Per cent. 42

9 Per cent. 43

12 Per cent. 44

15 Per cent. 45

18 Per cent. 46

21 Per cent. 47

24 Per cent. 48

27 Per cent. 49

30 Per cent. 50

33 Per cent. 51

36 Per cent. 52

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42 Per cent. 54

45 Per cent. 55

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120 Per cent. 80

123 Per cent. 81

126 Per cent. 82

129 Per cent. 83

132 Per cent. 84

135 Per cent. 85

138 Per cent. 86

141 Per cent. 87

Protestings. 400

Glue, White. 401

Glaziers' Points, Zinc. 402

Gum, Copal. 403

Gum, Damar. 404

Gum, Shellac, English, dark. 405

Litharge. 406

Pumice Stone, selected lumps. 407

Pumice Stone, Powdered. 408

Pine Tar, bolts. 409

Pitch. 410

Putty in bulk. 411

Putty in bladders. 412

Resin—Common and clear. 413

Spirits Turpentine. 414

Writing Spanish. 415

Waste, No. 1 Cop. 416

Waste, No. 2 White Machine. 417

Waste, No. 3 Colored. 418

Waste, No. 4 Colored. 419

Waste, Washed Machine. 420

Waste, Washed Machine. 421

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Waste, Washed Machine. 451

HERMANN BOKER & CO.,

101 and 103 Duane Street, New York.

PROPRIETORS OF TRENTON VISE & TOOL WORKS.

PICKS, MATTOCKS, GRUB HOES, HAMMERS.

WROUGHT IRON STEEL FACE

(P. W. PATTERN.)

"FULLY WARRANTED."

Sole Agents for
H. Boker & Co.'s Celebrated "Tree" Brand Cutlery.
H. Heinisch's Sons Unrivaled Shears, Trimmers, Scissors, Japanned and Nickel-plated Ward & Payne's Sheep Shears.
Gardner's 1881 Razors.

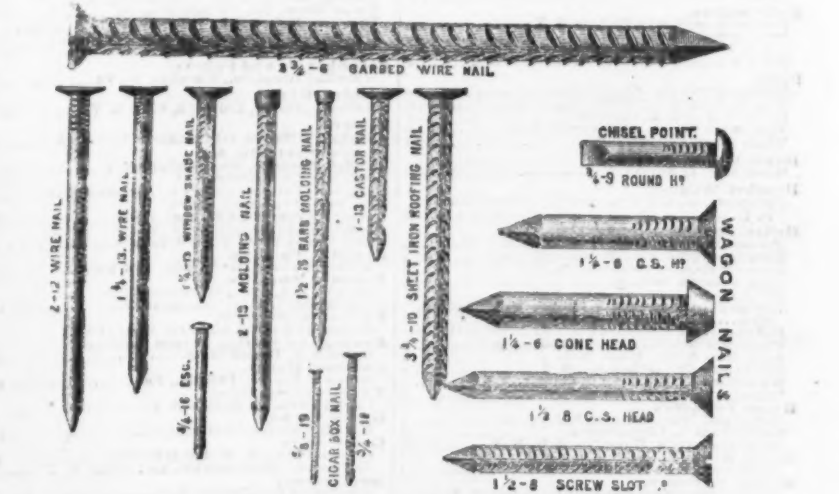
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and "Warranted Superior" to
All "Barlows, Pocket and
Table Cutlery.
Geo. Wootenholm & Son's,
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Jno. Wilson's Butcher Knives,
Steels and Shoe Knives,
New England Cutlery Co.'s
Table Cutlery,
W. Butcher's Files and Tools.
Guns and Pistols,
Arms and Ammunition.

OLD COLONY IRON CO.,

TAUNTON, MASS., Manufacture

NAILS, SHOVELS, SPADES, SCOOPS, &c., &c.
Warehouse: 211 Pearl St., New York. P. O. Box 1267. A. L. REID, Agent.



Wire Nails,

Steel, Iron and Brass Nails and Barbed Nails

Of every kind.
Roofing and Moulding Nails, Escutcheon Pins, Chair and Caster Nails, Cigar
Box and Window Shade Nails, Wagon and Boat Nails.

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Cleveland, Ohio.

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ST. LOUIS, MO.—Paddock Hawley Iron Co.

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LOUISVILLE—W. B. Belknap & Co.
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MONTGOMERY & CO.,

Importers of
Stubbs' Files, Tools and Steel.

Grobet Swiss Files, Chesterman's Measures,
Hubert's French Emery Paper, Horseshoe Magnets, &c.
Wm. Smith & Son's Celebrated Music Wire.
French Sheet Steel 3/4 in. wide from 4 to 65 Thousandths

Machinists', Silversmiths', Jewelers' Die Sinks' and
Sewing Machine Manufacturers' Supplies,
105 FULTON ST., - New York.
Geo. W. MONTGOMERY. Geo. W. CHURCH.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Hatchets' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,

Ring Bush Hooks,
Ax Eye Bush Hooks,
Socket Bush Hooks,
Ward's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentines Tools.

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Paper Stock, &c.

(Dealers' Selling Prices.)

White Shirt Cuttings, No. 1. 75¢

White Shirt Cuttings, No. 2. 75¢

White Shirt Cuttings, No. 3. 75¢

White Shirt Cuttings, No. 4. 75¢

White Shirt Cuttings, No. 5. 75¢

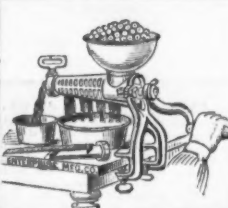

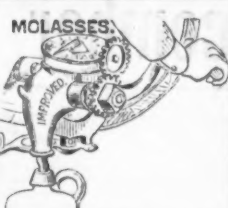
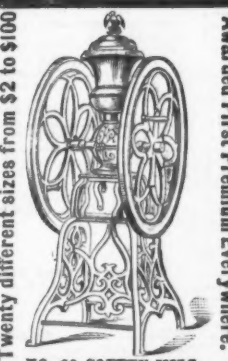

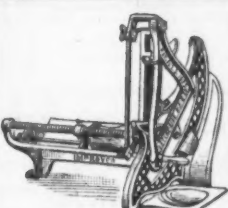
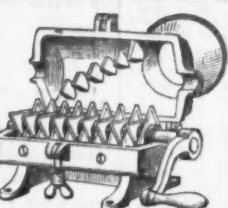

White Shirt Cuttings, No. 6. 75¢

White Shirt Cuttings, No. 7. 75¢

White Shirt Cuttings, No. 8. 75¢

White Shirt Cuttings, No. 9. 75¢

White Shirt Cuttings, No. 10. 75¢

 Fruit, Wine & Jelly Press.	 SAUSAGE STUFFER.	 MOLASSES. Self-Measuring Faucet.
 Twenty different sizes from \$2 to \$100. Awarded First Premium Everywhere. NO. 20 COFFEE MILL.	ENTERPRISE MANUFACTURING CO. OF PA., THIRD & DAUPHIN STS, PHILADELPHIA, PA.	
	 Tincture Presses, Self-Weighing Cheese Knife, Cork Presses. THE BEST ARE THE CHEAPEST. MRS. POTTS' Cold Handle Double Pointed Sad Irons. SOLD BY HARDWARE DEALERS. SEND FOR ILLUSTRATED CATALOGUE, FREE.	
 Smoked Beef Shaver.	 SAUSAGE CUTTER.	 Bung Hole Borer. Tobacco & Root Cutter.

THE STANLEY WORKS,
MANUFACTURERS OF
Wrought Iron Butts, Hinges
AND
DOOR BOLTS,
Plain, Japanned, Bronzed and Plated.
FACTORIES: New Britain, Connecticut.
WAREHOUSE: 79 Chambers St., New York.



Having bought out entire Machinery of the Star Tool Co., we are now prepared to supply the Trade with a full line of
STAR TRY SQUARES, RULES, &c.
First-Class goods in every respect. None but best stock used. Send for Circular and Price List.
REED & CO., Higganum, Conn.
Sole Manufacturers Star Goods.
For Sale by C. E. JENNINGS & CO., 96 Chambers St., N. Y.



Bemis & Call Hardware & Tool Co.
PATENT COMBINATION WRENCH.
These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench thus making a combination which has no equal.
For Circulars and Price List, address
BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.

BEAN'S PATENT
TUBULAR FRAME GARDEN & RAILROAD BARROWS.
With patent steel and iron wheels. Handles and wheels shipped in bundles. Woodwork in crates at lowest rates of freight. The Barrows are easy to set up, and are the largest, strongest and best Barrows in the World.
For circulars and price lists, Address
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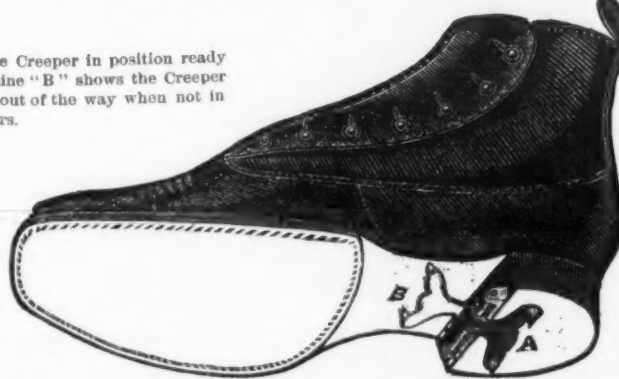
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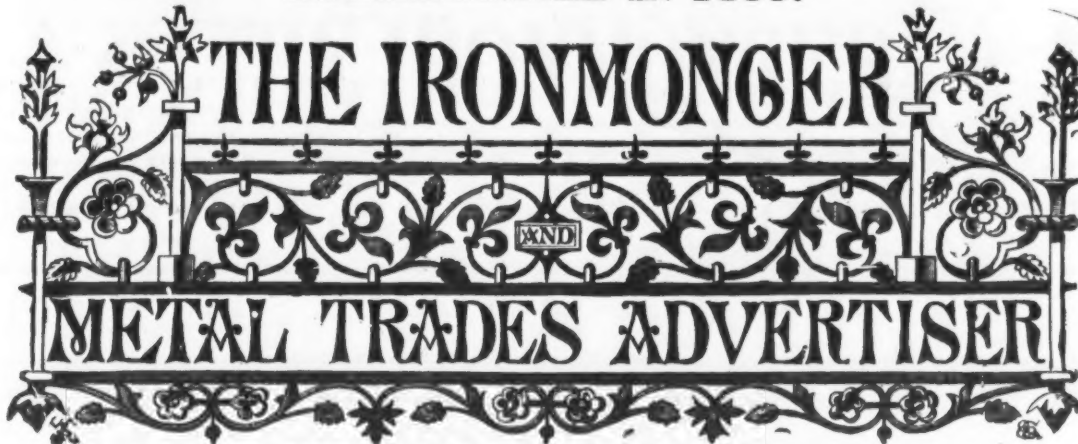
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to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes French,
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It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to
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DECEMBER 6, 1882; JANUARY 6, FEBRUARY 3, MARCH 3 & 31, APRIL 25, MAY 26, JUNE 23, JULY 21, AUGUST 18, SEPTEMBER 15
OCTOBER 13, and NOVEMBER 10, 1883.
This Supplement is published in**FOUR LEADING COMMERCIAL LANGUAGES**of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within each,
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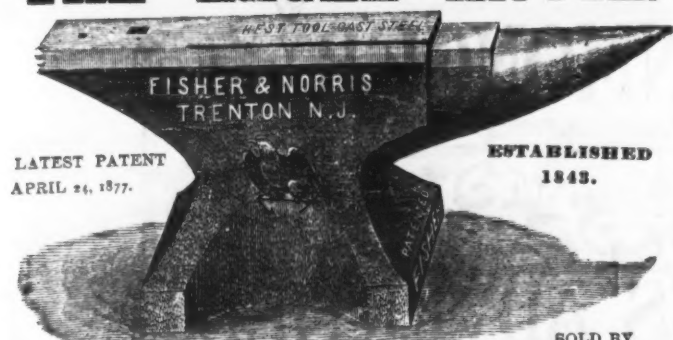
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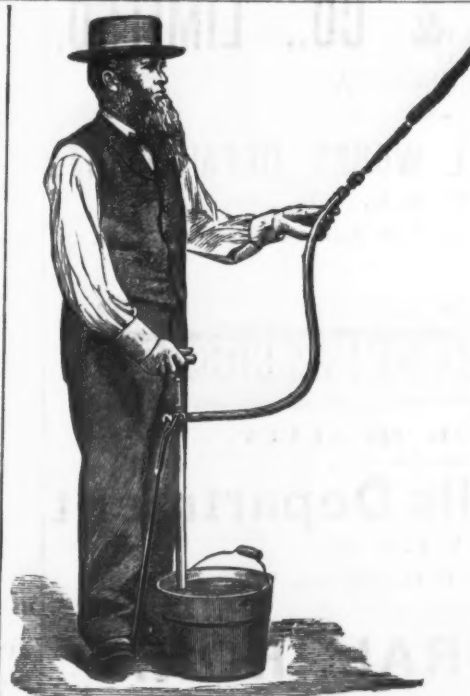
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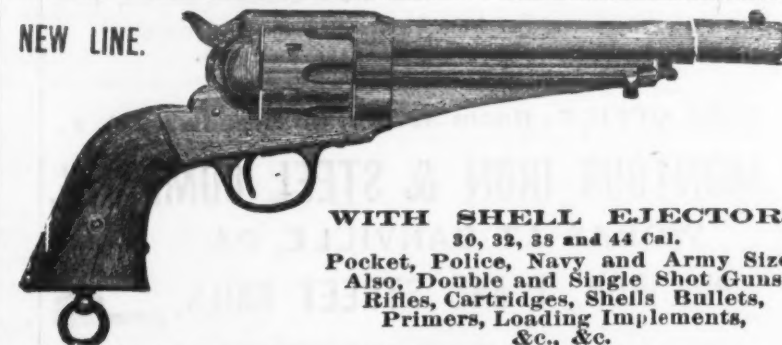
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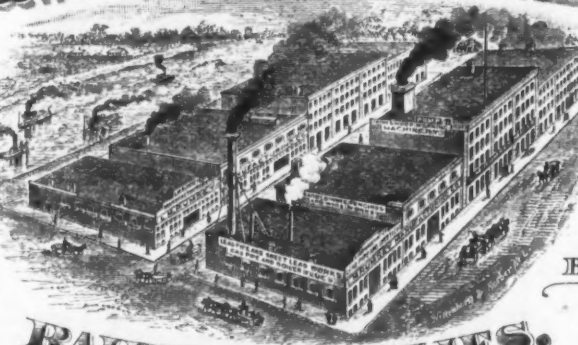
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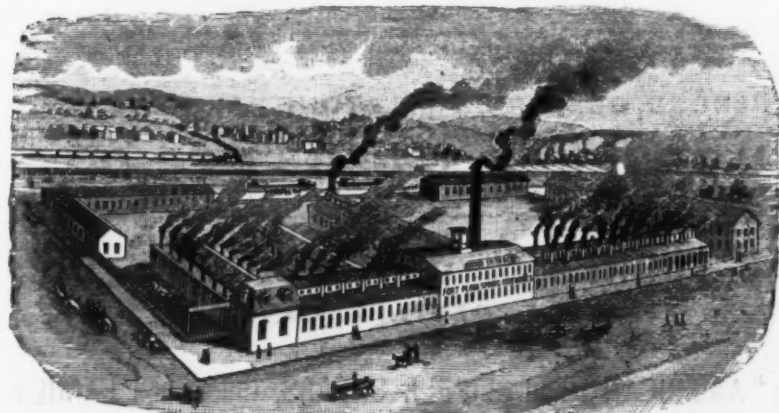
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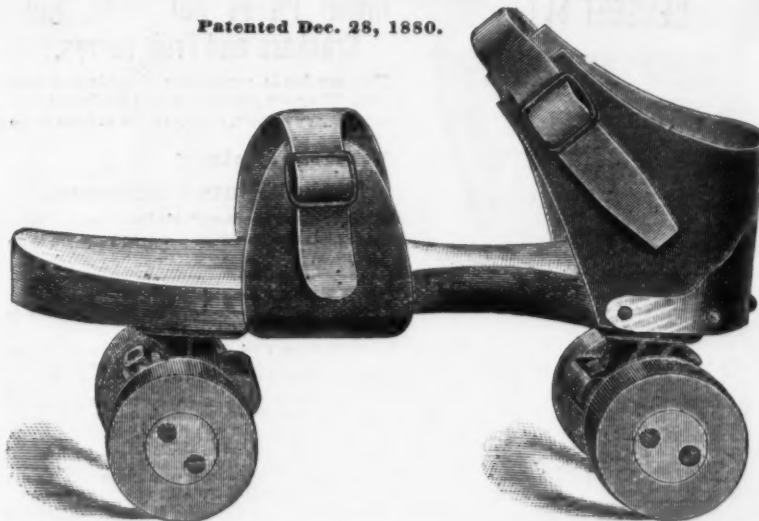


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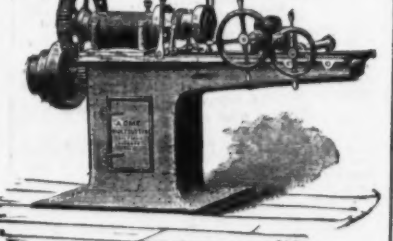
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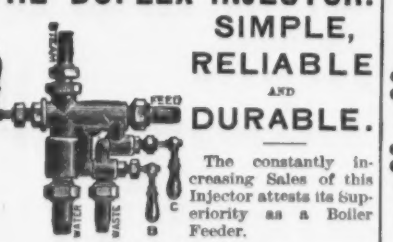
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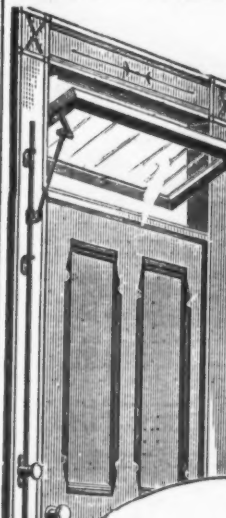
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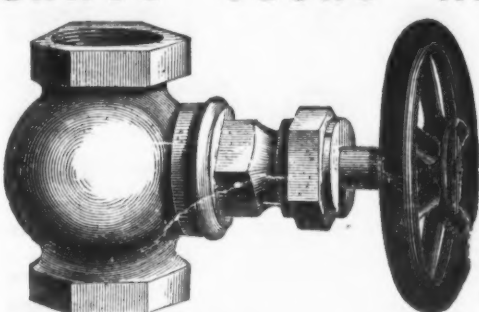
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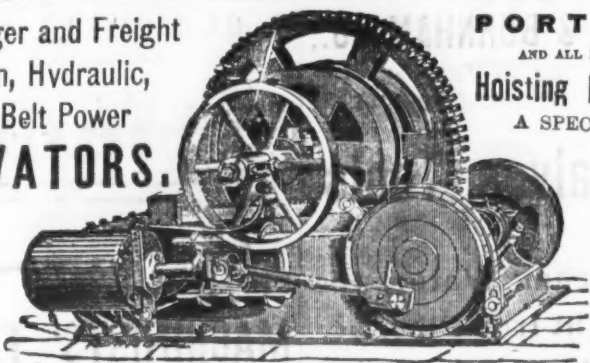
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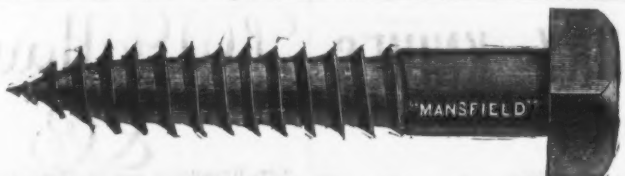
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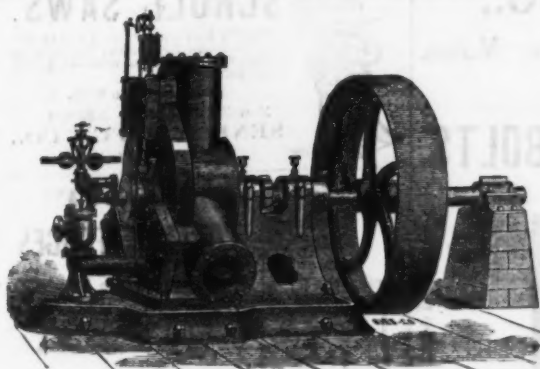


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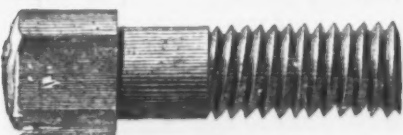
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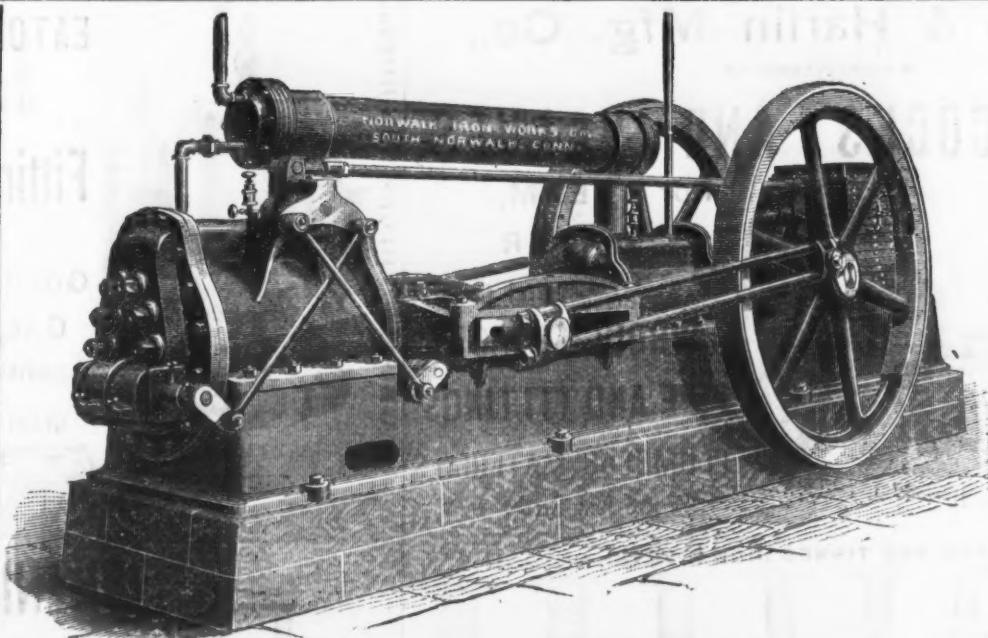
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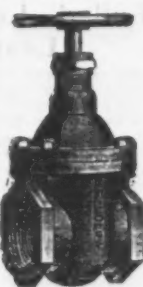
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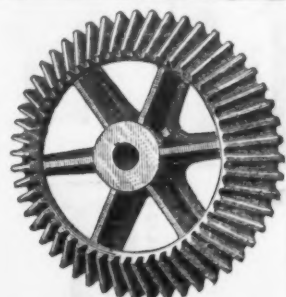
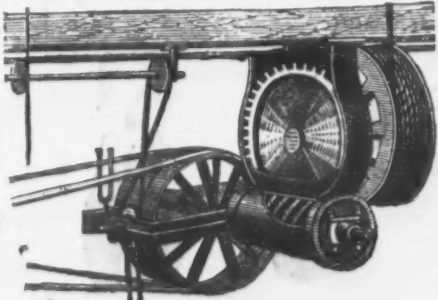
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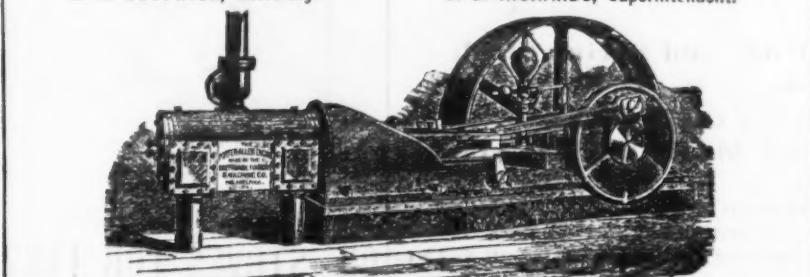
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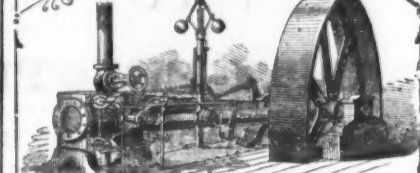
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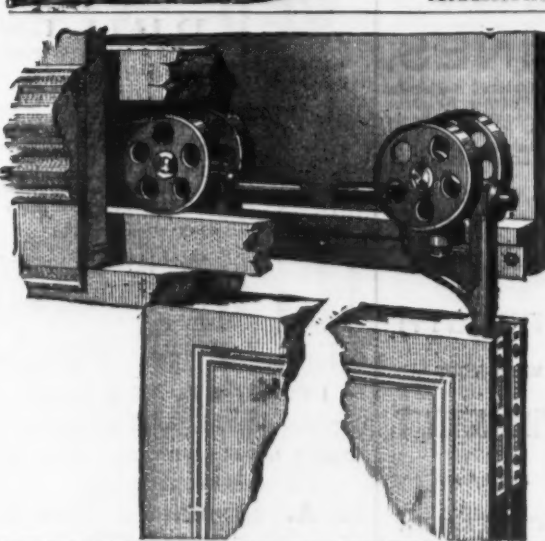
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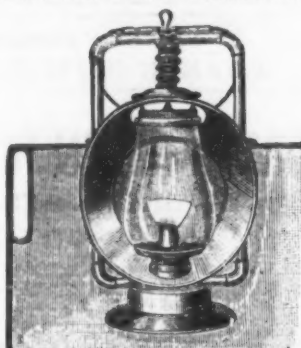
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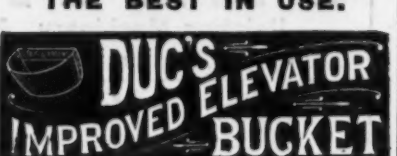
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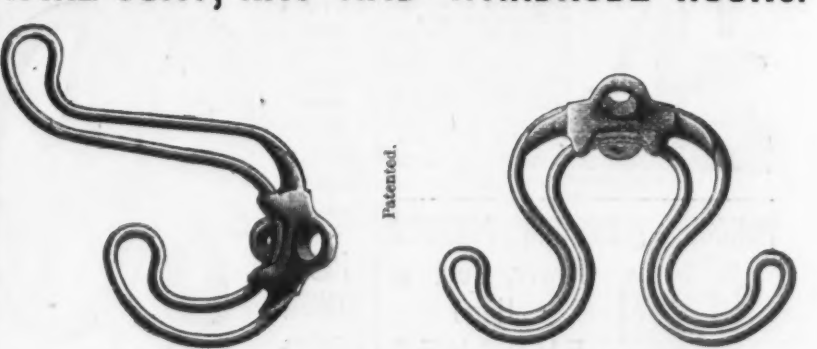
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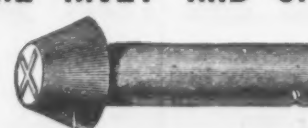
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